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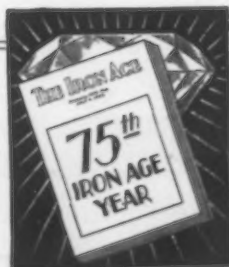
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THE IRON AGE

New York, August 21, 1930

ESTABLISHED 1855

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Construction Gains Hinge Largely On Revival of Home Building



By

THOMAS S. HOLDEN

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AT the end of July total contracts for building and engineering work let this year in the 37 States east of the Rocky Mountains had amounted to \$3,005,541,700, which was 18 per cent behind the contract volume for the first seven months of 1929. Owing to a surprisingly low July figure after a high total in June, the latest month's total was a setback, perhaps temporary, in the gradual upward struggle of the construction industry toward a normal volume of operations; at the end of June the contract record was only 12½ per cent behind last year.

It is to be noted that in 1921, following a moderate rise in the spring, construction contracts slumped off for several months to July, resumed an upward trend in August and proceeded continuously upward in a general construction revival; this trend in 1921 was particularly marked in residential building contracts, then as now the most critical factor in the situation. While many conditions today are different from those of 1921, the course of revival in that earliest depression period may have some bearing on the probable course in 1930.

The accompanying chart shows conclusively the paramount importance of residential building in the current business depression. Its decline has been far more severe and more prolonged than the decline of non-residential building; the movements of the residential building curve have regularly anticipated the movements of non-residential building volume, and business looks to a definite upturn in residential building as the signal of general business revival.

Index numbers of residential building contracts have turned upward in the past few months; they have slipped back, but have remained above the previous low point. The record volume of public works and utilities projects started this year has mitigated considerably the severity of business depression, but it has been insufficient to offset the decline in residential building. The contract record for the first seven months of 1930 has been divided as follows: residential building, \$663,745,100, 48 per cent behind last year; non-residential building, \$1,378,191,600, 13 per cent behind last year; public works and utilities, \$963,605,000, 21 per cent ahead of last year,

and well above the records of similar periods in any previous years. These percentage spreads from last year's record all looked better at the end of June than at the end of July, due to the low July contract total.

During these months of distressingly low construction activity there have been steady accumulations of plans and money and, recently, some improvement of business confidence. Contemplated public works and utilities projects have been reported this year in double last year's dollar volume; contemplated non-residential projects reported thus far have exceeded by 14 per cent the amount reported in the plan stage in the first seven months of last year; contemplated residential projects have dropped off in about the same proportion that contracts have fallen, but plans for projects in this class are usually neither made nor reported as far in advance of contracts as in other classes of work. Of more significance for residential building was the announcement several weeks ago by the National Survey of Real Estate Boards that a survey of lending institutions in a number of large and medium-sized cities showed a total of more than a billion dollars available for loans on residential projects.

Business Recovery Hinges on House Building

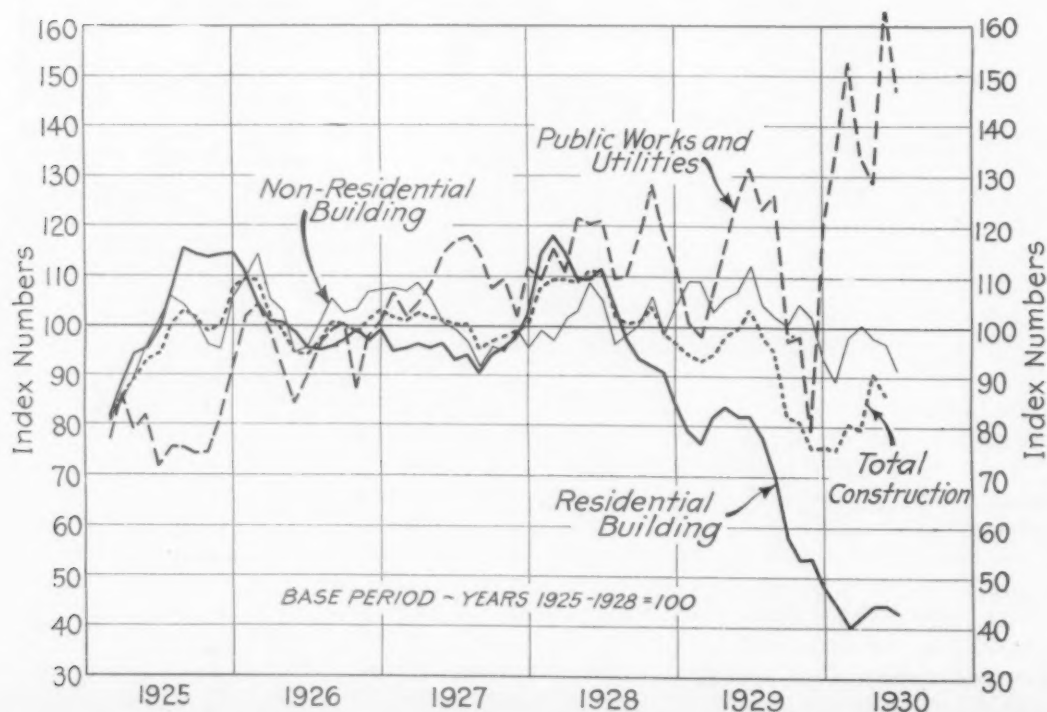
It is probably correct to say that business recovery hinges more on the exact status of residential building demand than on any other single thing. If this country had today a housing shortage such as it had in 1921, there could be little question that the stage is now set for revival and rapid improvement. But, it became evident in the early months of this year that our four years of peak residential activity, 1925 through 1928, had produced a surplus of housing which was only partially liquidated by reduced residential activity in 1929. Each month of subnormal residential activity in 1930 has by the fact of subnormal activity effected progress in this process of liquidation of residential oversupply.

The past few months of severe depression do not

represent the entire period of readjustment to date; they represent the climax of a readjustment that has been going on in some departments of housing activity and in some sections of the country since 1925 and in the entire national field of residential building since the middle of 1928. Small house building reached its peak in 1925 and has declined steadily ever since, the residential peak of 1928 having been principally due to large-scale apartment building.

Total real estate activity in this country, as measured by numbers of transactions, was at the peak in 1925 and has declined steadily ever since. Of the 50 largest cities in the country, 17 had their peaks of construction activity in 1925 or before, 8 in 1926, 13 in 1927, 8 in 1928 and 4 in 1929. Local readjustments were going on in many centers long before the restricted credit conditions of late 1928 and of the year 1929 made the residential building and real estate decline national in scope; building volume was on the downgrade a long time before it gathered the momentum of descent that has been so spectacular in the past 12 months.

There are some other evidences besides the long duration and severity of the present depression that seem to point the way to better conditions. Interest on four to six months commercial paper turned down in November of last year; the curve of new bond issues took a definite upward turn in December. These are the customary first indications that usually result six to eight months later in increased residential building. Recent vacancy surveys have shown normal vacancy conditions in cities of various sizes and in different sections of the country. The National Association of Real Estate Boards, reporting the results of its latest semi-annual survey, stated that "the single-family dwelling and the apartment house have at present a healthy, normal ratio of supply and demand throughout the country as a whole." The writer interprets this statement as meaning that liquidation of residential oversupply has been approximately completed in most centers;



DECLINE of residential building from its peak in 1928 has been very sharp, as the chart shows, while public works and utilities construction has had an upward trend since late in 1929, having been stimulated then to some extent by President Hoover's conferences.



ALTHOUGH building for public works and utilities has gained 21 per cent in seven months of this year over last year, residential building is 48 per cent behind and non-residential building 13 per cent off.

House shortage in 1921 brought building boom which aided materially to lift business depression, but no such shortage exists today.

However, survey shows that single-family dwellings and apartment houses are in normal supply and demand ratio.

Individual home today is being sold in competition with automobile and many other so-called luxuries. While automobile prices have declined, home-building costs have advanced, thus narrowing market for homes.

Assembled house, with many sections built in the shop ready for erection, may solve problem of bringing cost factor to a point of widening home-building market.

there are naturally some sore spots in which conditions will be subnormal for some months to come. It does, however, seem entirely possible that residential activity may increase in enough communities in the last four months of this year to register a definite upturn in the general residential building curve and that liquidation of residential oversupply should be completed practically everywhere by the end of the year.

Money Available for "Legitimate" Projects

A significant factor in all the announcements of lending institutions is the usual stated condition to the effect that plenty of money is available for "legitimate" residential projects, but not for "speculative" projects. In so far as the term "speculative" is applied to all housing produced for sale or rent, this is a statement of a policy of extreme conservatism that will have to be modified before large-scale residential building activity will be resumed. Normally two-thirds of the total investment in residential building activity (which includes hotels, apartments and one and two family houses) is in apartment projects and in house development projects. These are the classes of projects that were most overdone in the peak years; these are the projects that have declined most severely; these are the ones that must come back, if we are to resume a normal volume of residential building activity. But, if such a thing is possible, they should come back on a business basis, as opposed to the speculative basis of housing production we have known heretofore.

As between the peak of our residential building boom and the trough of the present depression, expenditures for dwellings erected singly have fallen off 17 per cent; for hotels, 33 per cent; for apartments, 56 per cent; for house development projects, 56 per cent. Within the important class of residential building, the field of activity which produces housing on a wholesale scale is the really critical factor in the situation; it always has been.

When the business world passes through a period of atonement for its speculative sins, there is always much searching of the heart to extract good

counsel for guidance in the future and many good resolutions looking toward prevention of the recurrence of past excesses. Many of the good resolutions are forgotten when boom times come again, but some of them are likely to stick.

Some Resolves to Eliminate Speculation

The more substantial builders, subdividers and real estate men have learned the lesson that excessive and uncontrolled speculation in real estate and building not only brings about depression, but tends to undermine values over long periods of time, if not permanently. They are now resolved to exercise a greater measure of control than ever before, largely through local and national real estate boards, through which more frequent and more careful surveys of new building requirements are being made and more complete cooperation with city-planning officials may be effected in order that the haphazard city growth of the past may give way to business-like advance-planning for more efficient communities. They are enlisting the interest of financiers and lending institutions in plans for better systems of financing prospective home owners; they are studying the taxation problem, to see whether mounting assessments are unduly discouraging purchases of individual homes.

Out of these tendencies are likely to come stronger, better financed, more responsible residential development companies; we may not eliminate the "shoestring" operators, but they are out of the market today and they may return only after the more responsible operative builders have so improved their methods and strengthened their positions that they will dominate their field.

Realizing that the individually owned house is in competition with both the rented house and with the apartment, students of housing economics are giving the most careful study to the relative merits of various types of housing. One of the most striking developments of the recent boom was the production of apartment buildings on a much larger scale than ever before; there were several years in which as many family units were produced in this country

in multi-family buildings as in single-family houses. Increased urbanization, rehabilitation of urban areas, and the fact (or at least, a very strong suspicion) that the apartment does effect economies by wholesale production methods that have not yet been achieved in wholesale production of one and two-family houses, all seem to point toward a continued upward trend of apartment building.

Assembled House May Come to Cut Costs

There is also recognition today that the individual house is being sold in competition with automobiles, radios, attractive clothing, commercialized entertainment, good schools, summer camps for the children and every other kind of attractive goods that tempt the money out of consumers' pockets. Looking at the automotive industry (as every other industry does), the building industry sees that its success was due primarily to two important achievements: (1) it turned out a product so good that everybody wanted one; (2) it found a way to make the product cheap enough for practically everybody to have. It is well recognized that all the many meritorious improvements in housing and housing facilities have been effected at continually increasing costs to the purchaser, thus reaching an ever-narrowing market. Today, architects, engineers, and manufacturers are studying the problem of technological improvements in uses of materials and processes of construction that will cut the cost of the assembled finished product (the building) to the customer, and thus auto-

matically widen the market for new residential buildings to reach income classes which cannot today either purchase new buildings or rent space in them. Much interesting experimentation is going on in this country and abroad. It remains to be seen whether the factory-produced house is the solution of the problem or the apartment (better planned and produced on a business basis). But there is a distinct tendency toward more fabrication in the shops and less assembling by hand on the job; for example, metal casements assembled complete with frames, screens and adjusters sold as a unit, ready-mixed concrete delivered on the job ready to pour, large-sized wall units of metal backed by a couple of inches of insulating material, floor units of steel plates and joists assembled with reinforced gypsum blocks for insulating purposes, doors with the hardware supplied at the factory, and numerous other cases could be cited.

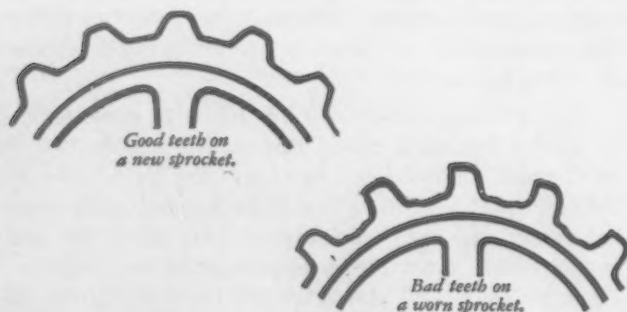
It is to be noted that most of these experiments indicate the possibility of much wider use of metals as building materials. There is, however, much research on other types of materials looking toward wider uses on the basis of greater efficiency and reduced building cost, such as clay products, gypsum, and various other products available to the modern builder. Out of this competition for technical improvement and out of the increased realization of the economics of the assembled building, we may expect notable progress in the coming decade.

How to Make Chain Drives Last Longer

BY CHARLES R. WEISS*

TO make chain drives last longer, there are five simple things to do.

FIRST—Proper alinement. Be sure that sprocket wheels are in line on the shafts. If the sprockets are not exactly in line, a side pull develops which concentrates the load on the side of the sprocket



teeth and on one side of the chain. This faulty alinement results in excessive wear on both chains and sprockets.

SECOND—Proper adjustment. The chain should be run just a little slacker than a belt. Too much tension causes undue wear on the chain and wasteful friction on the bearings. Not enough tension, of

course, may allow the chain to jump the sprockets or ride the teeth and break.

THIRD—Frequent lubrication. The chains should be lubricated with a good grade of light cylinder oil. A paint brush is a good thing for applying oil to the chain joints. Paint the open joints on open (upper) side. Oil the close-joint chains on inside (upper side of lower run) while drive is running slowly.

FOURTH—Frequent cleaning. Open drives should be cleaned regularly. Take the chain off and clean it well by soaking and dipping in kerosene. Dry well and oil it thoroughly before starting up again. Before shutting down a machine for a period of time clean the chain and oil it with heavier oil or grease. When it is to be used again reclean and oil with light oil.

FIFTH—Well-fitting sprockets. Last, but not least, look at the sprocket wheels from time to time to make sure that they are not worn enough to injure the chain. Before the teeth are worn to a hook shape, as shown in lower illustration, the wheels should be replaced with accurately made and close-fitting sprocket wheels.

By giving only ordinary attention to chain drives, they are made to last longer and run better and also reduce the chances of a breakdown.

*Chief engineer, Link-Belt Co., Indianapolis.

How Germany Has Successfully Developed the Welded Ship

RAPID progress of German shipyards in the application of welding to the construction of ships, beginning with the small, gasoline-driven experimental vessel and advancing by stages to a 10,000-ton battleship now being built for the German Navy, has excited the interest of the ship-building countries of the world. Electrically welded ships were developed under pressure of the Treaty of Versailles, which restricts German war craft to 6000 tons for cruisers and 10,000 tons for battleships. It was believed that electrical welding appeared to offer the best means to reduce ship weights.

This development of the past few years called not only for experimental building to determine the proper design and methods of welding, but required the training of a considerable number of trustworthy welders. The first experimental welded vessel was a small, gasoline-driven motor boat, 52 ft. 6 in. overall, 10 ft. 6 in. beam, and 5 ft. 1 in. draft. Before actual construction of this vessel began numerous breaking tests were systematically made in the laboratory of the Deutsche Werke Kiel, A. G., which brought the knowledge that most of the established methods used in constructing ships must be abandoned and new methods adopted.

First Vessel Tested

It was concluded that welds lengthwise of the hull must be avoided in specifically stressed parts, although permissible in less stressed parts. Where continuous lengthwise seams in the under and upper strakes of the vessel cannot be avoided, riveting should be employed. Tests of lap and butt welding resulted in the adoption of butt welding, which competently done was concluded to be the only method of bringing out the advantages of welding.

The trial vessel underwent tests to determine the stanchness of the hull. It was filled with water as



The trial vessel, a 52-ft. 6-in. motor boat, suspended from a crane before being dropped into the water to test its stanchness

the most simple and best proof of the excellence of the welding, as a badly welded seam will usually leak. Such a seam must be cut out and re-welded. As a final test of the general strength of the test vessel, the hull was raised by a crane, 3 meters (nearly 10 ft.) above the water at the bow and 4 meters (13 ft.) above at the stern, after which it was dropped. The hull

was found to be water tight after this test, and no bulges or other changes appeared on the flat stern.

This test vessel was driven by a four-cylinder gasoline motor, which developed 100 hp. at 100 r.p.m., driving it through a reversible gear at a speed of 11 knots per hr. The boat was found to be remarkably free from vibration at full speed, or with the motor running free, from which it was concluded that welding contributes to a more complete connection of the parts of the vessel than riveting.

A comparison of the weight and cost of the welded vessel with a riveted ship of the same size showed that the welded boat had the advantage of less weight, but the cost of construction was slightly greater. However, the object of the construction, training of welders and knowledge of the proper design of a welded ship had been fully achieved. This ship has been in operation for some years now and under constant observation has failed to develop any alteration of the welded joints.

Oil Barges Built by Welding

Success with the preliminary test vessel resulted in the construction of two 600-ton oil barges for the German Navy. They were constructed for service along the Baltic Coast and North Sea and have in general been towed long distances, using their 75-hp. Diesel motors only for service in ports.

In constructing the oil barges, which contain six compartments formed with a central bulkhead running fore and aft of the ship and two cross bulkheads, the

material used was to the specifications of the North German Lloyd for short-cruising coastal vessels.

Before construction, special consideration was given to determination of the thickness of the outer skin. As a welded hull was regarded as having 100 per cent of the strength of the individual plates, the thickness of these outer plates could, theoretically, be reduced in proportion to the efficiency of riveted joints,

curvature set in, the plates were welded in sections. Conclusions drawn from the second test made on the preliminary vessel that continuous lengthwise seams should be riveted led to riveting the strakes above and below. In joining the plates, butt welding was employed with shapes in back for stiffening. The final measurements of these 600-ton tank barges were 40.6 meters (133 ft. 3½ in.) overall, 8.20 meters (26 ft. 3½ in.) beam and a draft of 4.85 meters (15 ft. 10¾ in.).



One of two 600-ton oil tank barges constructed for coastal service in the German Navy. Riveting appears where the deck joins the hull, as a continuous lengthwise weld is not considered desirable

or, say to three-fourths the thickness required on a riveted vessel.

While the reduced thickness of the plates in the hull would have been sufficient for lengthwise strains, it would have been inadequate to meet the local stresses of water pressure and blows against the sides of the vessels when moored at docks. Consequently, the outer skin of the hull could only be reduced in thickness by 1 mm., so that it was made 7 mm. instead of 8 mm. (0.276 instead of 0.315 in.) and with decreased distance between the ribs.

In the outer skin 1.5 meter (59.1 in.) plates were used amidships, applied vertically; fore and aft where

Welded Ship Has Increased Load Capacity

A comparison of the welded vessel with a similar ship built with riveted construction determined that the riveted ship would have weighed 208½ tons compared with 144½ tons for the welded ship, a difference of 30 per cent. In load capacities, the riveted ship carries 556 tons, while the welded vessel of the same measurements has a capacity of 620 tons, 11.5 per cent more. Based on load as compared with displacement, the welded ship had an advantage of 7.4 per cent.

While exact costs are not available, the cost per ton of welding ship material is greater than for riveting. In the case of the 600-ton oil tankers, however, the cost slightly favored the welded ship, as the advantages of the process were greater with the larger and heavier vessel. In a comparison of welded with riveted vessels it appears that the welded ship costs 29 per cent more per ton of material than the riveted, but the total cost of the completed ship per ton of load carrying capacity is 11 per cent less in the welded vessel.

Material Must Be Carefully Laid Out

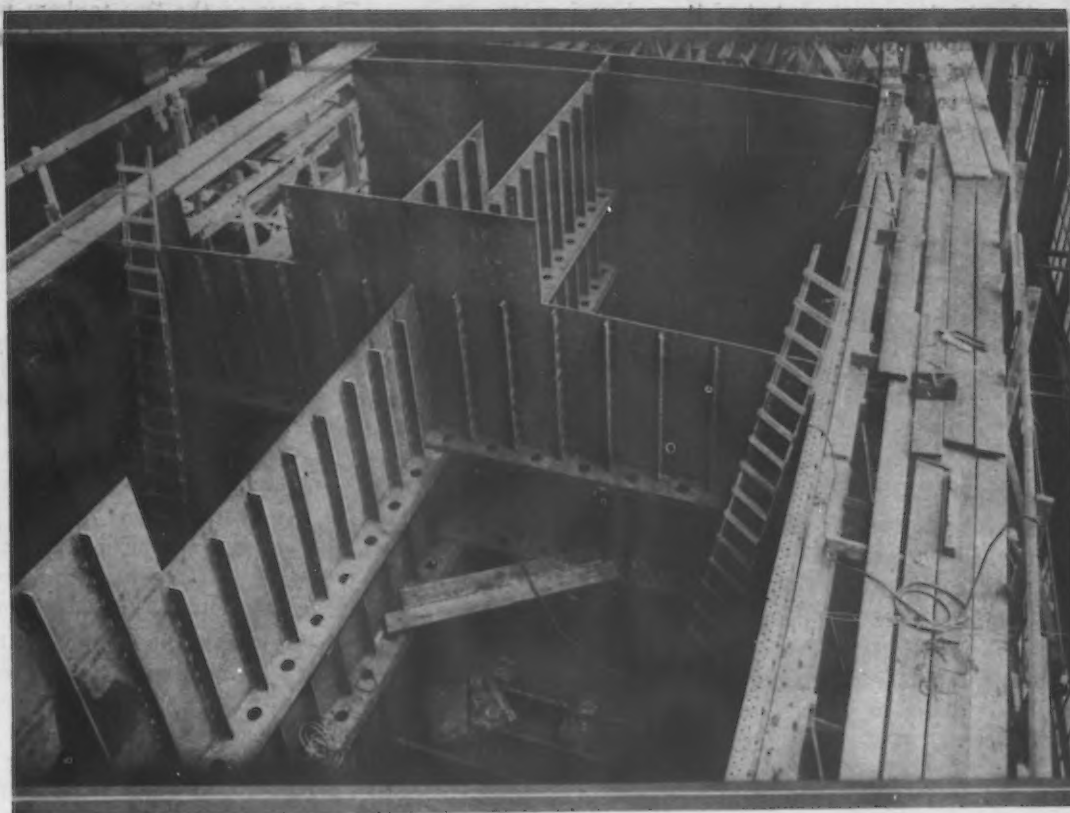
In welding a ship, the material must be carefully and systematically prepared in the shop. Plates are prepared in the mold loft and the places marked where the floors, frames and stiffening sections are to be attached, with color used for the kind of joint required. The edges are beveled with an angle of about 30 deg. for the full width. For construction of the hull, a mold scaffold

is necessary as the outer skin of the hull must first be completed, after which the frames are attached.

An important task is to arrange the progress of the welding to avoid strains in the seams, joints and flat surfaces. This requires care to make proper allowance for the shrinkage of seams and joints.

As plates lying horizontally can be welded more accurately and rapidly than when vertical or overhead, the bottom pieces are welded with the frame and beams on the mold floor, as are also the central bulkhead running fore and aft and the cross bulkheads. It has been found advantageous to prepare as many pieces as possible away from the ship, assembling the

BULKHEAD sections in the oil barges were welded on the floor and assembled in the hull in as large sections as could be conveniently handled. Stiffening is arranged to parallel the plate joints. These compartments were found to be completely water tight under service conditions and were used for cargo



vessel in as large sections as may be handled properly.

It has been found desirable to have the stiffening pieces on the bulkheads parallel with the plate joints, the divisions so arranged that a stiffening piece is at each plate joint. All stiffening should be on the same side of the bulkhead, as the plates may be better arranged on the mold floor if this is done.

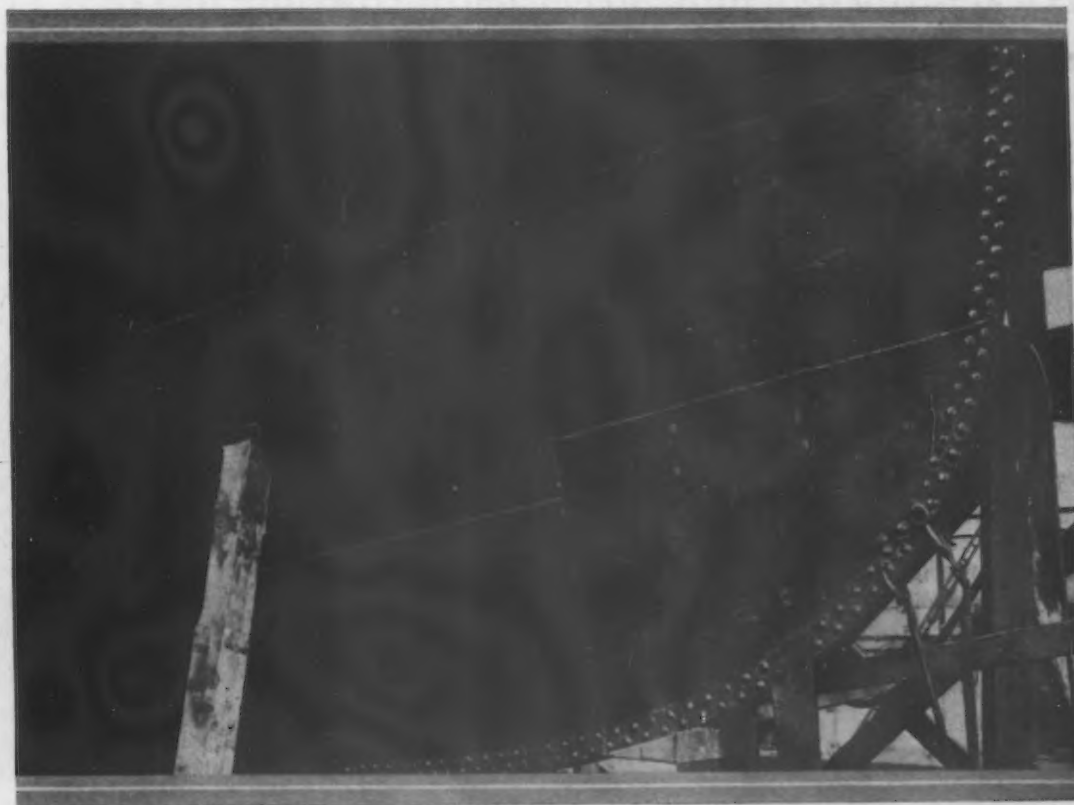
The plates should first be laid on the mold floor with a space between them as great as the thickness

of a weld-wire, after which they should be joined temporarily at points about 120 mm. ($4\frac{3}{4}$ in.) apart, with light welds.

Weld From Amidships to Ends

The final welding of the seam should begin with the middle plate, and in the middle of the seam or joint. Each seam or joint should be completely welded before beginning the next. Normally, strains are

BOW of a 2000-ton ocean-going freighter under construction at the Deutsche Werke Kiel, A. G., showing the weld-seams in the hull and riveting along the keel, where a long seam is necessary



avoided by this method, but if they should occur, the small temporary welds would be broken and corrections could be made. If strains are not sufficient to break the temporary welds, these welds will ordinarily disappear with the final welding, or cause no difficulty.

Assembling of the whole is done by first laying the plates of the outer skin in the form scaffolding and temporarily attaching them with the welds at short intervals. After this the outer sections are welded on, and finally the welds of the outer skin seams and joints are made. After all the welding has been done the riveting begins.

Welding the outer skin of the hull is done similarly to the bulkheads, beginning with the middle plate, amidships. Each joint must be completely welded before proceeding to the next plate, as the welder progresses from the center toward the stem or stern posts. Except for the middle plate, each one shrinks slightly, which is the chief reason for postponing riveting until completion of the welding.

Special attention should be given to the preparation of seams joining thick plates with thinner ones, a sufficient planer cut being taken from the edge of the heavy plate to bring it down to the thickness of the lighter.

First Tanker Ready in Four Months

On the first of the 600-ton oil tankers constructed at the yard of the Deutsche Werke Kiel, A. G., 18 and at times 19 fully instructed welders worked in day and night shifts and the ship was completed in four months. After several months of service, thorough investigation of the condition of the vessel developed no faults. As in the case of the small test motor boat, it was found that there was practically no vibration of the hull from the Diesel motors.

The first of the two tankers was found to have a capacity of only 600 tons instead of a maximum of 620 tons as had been calculated in advance. This resulted from the fact that the full saving in weight expected had not been realized, and it had been built with the specification "no lengthwise seams in the tank room." As a result more displacement was required than originally estimated.

No Leakage of Bulkheads

Between building the first and second of the 600-ton vessels, however, it was concluded that lengthwise seams in the tank compartment did not constitute an element of danger, and in the second ship the possible load was increased by moving the end bulkhead. It was also found that leakages of the bulkheads by loosening seams after long use would not be encountered, so that in the second ship the compartments were used for cargo, and the loading capacity of the boat was increased to 775 tons with a corresponding lessening of the previously necessary freeboard.

In abandoning the theory that lengthwise seams in the strakes should be riveted instead of welded, it was found that even with riveting, the ensuing stresses must be offset by keeping the specific strains far below the elastic limit. With welded pieces, the small expansion of the welded seam may be rendered innocuous by increasing the cross section of the strake and thus postponing the beginning of expansion.

Since construction of the two 600-ton oil tank barges for the German Navy, a 2000-ton freighter has been laid down at Kiel and the much discussed 10,000-ton German naval ship Panzerkreuzer will be launched this fall. The accompanying photograph shows part of the hull of the freight steamer with riveting along the keel and stem.

Nickel-Molybdenum Steel Castings Strong at High Temperatures

TO fill the need for a steel of very high tensile strength at elevated temperatures—as, for example, for turbine housings—Liestmann and Salzmann as reported in *Stahl und Eisen* (No. 50, 1930), undertook a systematic study of a series of cast alloys containing various small percentages of nickel and molybdenum.

While it was fairly well known that these elements together—but not nickel alone—increased the elastic limit and ultimate strength above the values shown by unalloyed steels, such data as were available in the literature dealt almost exclusively with material which had been hot-worked.

Samples for test purposes were obtained by making up synthetic steels in a high-frequency induction furnace. The base materials used were high-grade scrap, ferromolybdenum, 97 per cent ferrosilicon, 88.5 per cent ferromanganese, and 98 per cent shot nickel. All of the melts contained approximately 0.20 per cent C, 0.30 per cent Si, 0.80 per cent Mn, 0.015 per cent P and 0.040 per cent S. Five groups were made up, each having a different nickel content—namely, 0.4, 0.6, 1.0, 1.5 and 2.0 per cent—and in each group the molybdenum was made to vary from 0.2 to 0.6 per cent. In all, 25 different steels were prepared and

cast into ingots which measured, after cutting off the top, 10 by 3.6 in. From each, two tensile bars were cut and pulled at 500 deg. C. (932 deg. Fahr.) in a 50-ton Amsler machine.

Notable superiority over the carbon steels was noted. These show an elastic limit of 8 kg. per sq. mm. (11,000 lb. per sq. in.) and an ultimate strength of 18 kg. per sq. mm. (25,000 lb. per sq. in.) All of the nickel-molybdenum steels fell within the range 16 to 25 kg. per sq. mm. for elastic limit and 29 to 44 kg. per sq. mm. for ultimate strength—an increase of 50 to 60 per cent.

The tensile properties tend to increase both with the increase in nickel and with that in molybdenum. At the same time the elongation and reduction of area decrease as the percentage of the alloy mounts.

Increases of 0.1 per cent Mo or 0.5 per cent Ni raise the elastic limit 1 to 2 kg. per sq. mm., respectively (1 kg. per sq. mm. is about 1,400 lb. per sq. in.). The effect of these same additions on the ultimate strength was found to be 2 and 1.8 kg. per sq. mm. respectively. Hence there is a slightly more favorable ratio of elastic limit to ultimate strength in the case of increasing nickel content than in that of increasing molybdenum.



Notably Light Airplane Wings of Alloy Steel Heat Treated

STEEL wing beams for airplanes, comparing in lightness and strength with aluminum alloy, are being fabricated on a production basis by the Metlab Metallurgical Laboratories, Inc., 1116 Montgomery Avenue, Philadelphia. At present an order is being executed for 15 sets of wing spars for the Kingbird, a twin-motor, eight-place, transport monoplane being built at the St. Louis plant of the Curtiss-Robertson Aircraft Mfg. Co.

The beams are of the Warren truss type, fabricated of chrome-molybdenum steel tubing, No. 4130 X, furnished by the Summerill Tubing Co., Bridgeport, Pa., an associate company of the Metlab Metallurgical Laboratories. No. 4130 X tubing has an analysis of 0.25 to 0.35 per cent C, 0.40 to 0.60 Mn, 0.04 per cent max. of P, 0.045 per cent max. of S, 0.80 to 1.10 per cent Cr and 0.15 to 0.25 per cent Mo.

The flange members of the beam are elliptical sections of tubing, while the lattices are rounds joined to the flanges by acetylene welding, the tension members passing completely through the flanges and being welded on both sides. All parts are assembled in the annealed condition, with accurate steel jigs and fixtures.

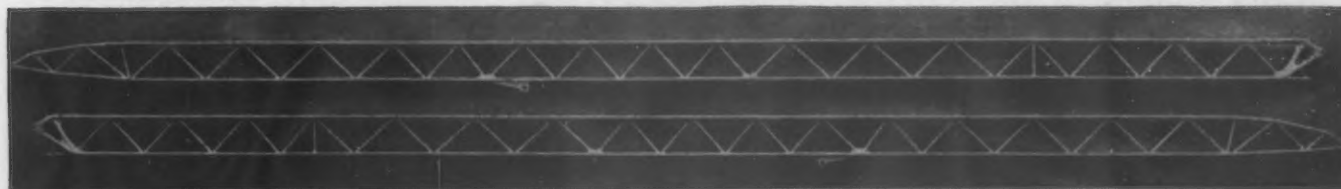
After the assembly, the beams are heat treated to a tensile strength of 140,000 to 150,000 lb. per sq. in. in a specially designed vertical electric furnace, quenched in oil from 1600 deg. Fahr. and tempered to the desired ductility. This heat treatment of the completely assembled beam corresponds to the annealing

and quenching of the Summerill special heat-treated chrome-molybdenum.

Distortion during heat treatment of the finished product, which has hitherto prevented the successful production of steel wing beams assembled by welding, has been entirely avoided by the special heat treating process used. Welding and heat treatment, the company points out, have permitted the economical and efficient use of alloy steel with the result that these beams compare in lightness and strength with wood and aluminum alloy beams, at the same time having the advantage of low cost, ruggedness, permanence and reduced crash and fire hazard. The weight of each beam is 43 lb. and the length overall is 21 ft. 6 in.

Heat treatment of the chrome-molybdenum tubing to a tensile strength of about 150,000 lb. per sq. in. permits the use of a smaller amount of material, so that the weight of the thin walled tubing is equivalent to aluminum alloy members of the same tensile strength. While the heat treatment increases the total cost, it is pointed out that the final cost of the product remains approximately the same, because of this saving in the weight of material used.

The chrome-molybdenum tubing when assembled into the wing beam has a tensile strength of about 95,000 lb. per sq. in., but by the heat treatment given to the completed beam this is increased to about 150,000 lb., so that the necessary wall thickness of the tube may be reduced considerably, offsetting much of the cost of heat treatment.



The welded and specially heat-treated chrome molybdenum wing beams weigh 43 lb. each and are 21 ft., 6 in. overall

Use of Fuel Oil in Steel Making Offers a Path to Increased Economies

By MARTIN J. CONWAY*

IT is a remarkable fact that the open-hearth steel process has not undergone any fundamental modifications since its introduction. Costs have undoubtedly been decreased by improved working methods. On the other hand, the calorific efficiency of the furnaces has not been essentially improved. For each 100 lb. of fuel burned, only about 30 lb. are utilized in the actual manufacture of steel; the remaining 70 lb. are a total loss. Therefore, the open-hearth furnace, regarded as an apparatus for the efficient utilization of gaseous or liquid fuels, can hardly be regarded as a success.

It is by no means beyond engineers to design a combination of gas and air ports to produce a high state of efficiency and combustion. The chief difficulty arises from the fact that with the regenerative system used at present, a furnace block designed to give the highest efficiency in combustion is not capable of dealing with the products of combustion at the outgoing end. Attempts have been made to overcome this difficulty with more or less success, but the large majority of open-hearth furnaces in this country are still of the character that have become familiar during past years.

The problem of producing a ton of steel with the lowest possible expenditure of fuel, either gaseous or liquid, is one which divides itself into three subdivisions, viz.:

- (1) Quality of fuel.
- (2) Furnace output.
- (3) Efficient utilization.

The chemistry of combustion as applied to open-hearth furnace practice is elementary.

From the standpoint of heat production for steel melting operations, combustion may be defined as the rapid combination of the elements of the fuel with oxygen. For the commercial production of heat it is essential that the combustible elements have a strong and ready affinity for oxygen. Carbon and hydrogen, which are by far the most important of combustible elements encountered in the common fuels, meet this requirement admirably. Fuel oil is especially rich in

THE open-hearth furnace is a poor utilizer of the heat supplied to it. Oil as a fuel offers opportunities to better performance. It remains that the human factor is still the large item but the fuel question is involved in the 33 causes of waste enumerated by the author. In spite of the notable economies and increased outputs of recent years, much progress seems yet possible.

these combustible elements.

The indefinite term "fuel oil" is employed broadly for the description of any product of petroleum which may be used for the production of heat, ranging from distillates down to and including any tar-like residual product which can be melted by steam heat and for which no better market can be obtained. Generally

speaking, there is no fixed specification for fuel oil for industrial purposes, each user being guided by his own peculiar needs and facilities; it must not, however, contain naphtha, and many consumers require that it be of such a consistency that it can be pumped through pipes and burners cold. The two important physical characteristics by which fuel oil is judged are therefore its specific gravity and viscosity.

The chief chemical feature, with the exception of the sulphur content, which is usually below 1.0 per cent, is the heat value of the fuel, which for fuel oil varies between 135,000 and 150,000 B.t.u. per gal.

Fuel oil to be used economically must be correctly atomized, which means that the oil at the burner must have the right viscosity, and as viscosity is a function of temperature the fuel oil system should be so designed that the proper oil temperature can be maintained at all rates of flow. A circulating system so designed that the foregoing points are well taken care of will handle almost any kind of fuel oil or tar that it is called upon to handle.

Advantages in Steel Making

Some of the advantages of liquid fuel in an open-hearth plant are as follows:

It does not deteriorate or lose its fuel value in storage.

It is easy to store and easy to convey to the point of consumption.

It burns with a very high flame temperature, but on account of the ease with which the flame may be directed it is not unduly severe on refractories.

Checkers remain clean longer with fuel oil than with producer gas; there is less ash carried along.

On account of the smaller volume of waste gases to be handled, stack capacity requirements are reduced 35 per cent, when compared with producer gas.

*Fuel engineer, Lukens Steel Co., Coatesville, Pa. These notes are from lectures used in classes for open-hearth furnacemen, conducted in the Lukens plant, as described in THE IRON AGE, Sept. 12, 1929, page 671.

Furnace temperature regulation is not affected by events beyond the control of the operator, such as occur in the gas making process.

Due to the fact that liquid fuel can be metered, individual furnace performance can be readily measured, thereby allowing the executive to compare the efficiency of his furnace operators.

Properly Atomized Oil Must Be Used

Fuel oil must be correctly atomized to be economically used. The pressure required to effect this atomization depends on the type and design of the burner and size of the outlet orifice, but with every type of burner an increase in pressure is necessary to atomize an increased quantity of oil.

The heating value of the gas formed through proper atomization of fuel oil is very high. Values of over 2000 B.t.u. per cu. ft. of the air-oil mist are easily obtained; and for this reason the flame should be properly directed and intimately mixed with air to obtain the full heating value. The temperature of an oil flame with complete combustion and without an excess of air is about 3750 deg. fahr.

Good practice in the atomization of fuel oil requires an average of 0.3 lb. of steam per lb. of oil burned. Theoretically 1 lb. of fuel oil requires approximately 14 lb. or 183 cu. ft. of air for complete combustion. Practically, 205 cu. ft. is considered good performance. The stack gases from an oil-fired

furnace for good efficiency should not contain less than 13 per cent of carbon dioxide.

Due to the fact that fuel oil is so high in heat value a small quantity wasted means a big loss in heat units, as compared with other fuels.

Some of the causes for high fuel oil consumption are given in the accompanying tabulation.

Each Checker Chamber Should Be Uniformly Heated

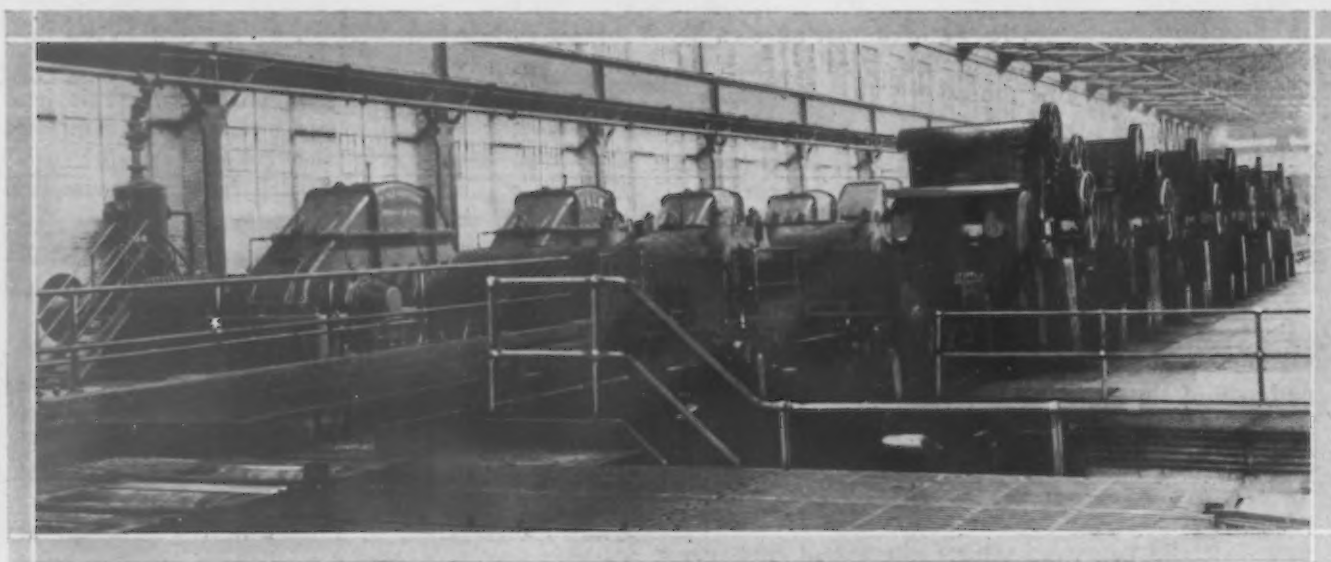
A word on checkers: The period between reversals has a direct bearing upon the design of the checkers in two important particulars, since the heating and cooling time determines the weight of checker brick required and the thickness of the brick composing it. There is a limit to the quantity of heat which may be absorbed and given out by the brickwork. The practical limit is reached when the entire mass of brickwork is raised to a temperature at which hot gases pass through with a very slight drop in temperature. The economical limit is reached when the spent gases leave the checker work at such a temperature that during the reversal period the temperature of the brickwork does not drop below the initial temperature of the incoming gases, plus the temperature differential necessary for heat transfer.

The *most important variable*, the period between reversals, is beyond the control of the furnace designer. This is strictly up to the first helper.

Quick reversals are necessary at certain stages of
(Concluded on page 517)

Usual Causes of Waste

- | | | |
|--|--|---|
| 1—Lack or excess of draft. | cording to working of furnace. | and unnecessary delay from inadequate pit or crane service. |
| 2—Too much or not enough air. | 13—Charging too many furnaces at one time. | 23—Low tonnage — due to light weight, low bottoms, holes in bottoms, cold heats, pit scrap and butts. |
| 3—Loss in fuel from air leaks around the furnace flues, checker chambers and valves. This air infiltration acts as ballast by robbing the furnace of heat carried out in the waste gases. If the furnace man cannot stop the leaks around his furnace he should report them to his melter, and keep at it until the brickwork is repaired. | 14—Keeping oil on idle furnace or while waiting on start, instead of dampering down. | 24—Extra delay from high and low metals. |
| 4—Bad burner tips. | 15—Failure to notify stock yard as to approximate tapping time. | 25—Irregular reversing. |
| 5—Wrong direction, elevation or placement of burners. | 16—Leaving heats lie when ready to work, or waiting for bath to open up after heat is clear. | 26—Delays due to poor tap hole. |
| 6—Excess steam or lack of sufficient steam. | 17—Pouring heats too close and cold. | 27—Delays from hard taps; be prepared by having oxygen tank and lance pipe ready. |
| 7—Turning oil on burners ahead of the steam when reversing. | 18—Keeping metal too hot when melting high; pulling bottoms, causing loss of fuel when replacing same. | 28—Bad bottom. Repair trouble as soon as it shows up. Have rabbles on the floor at all times. |
| 8—Wet steam. | 19—Phosphorus delays — improper working of heat. | 29—Ends of bottom too low for proper draining of the furnace. |
| 9—Cold oil. | 20—Delays due to a lack of a prompt supply of ore, dolomite, spar and pig. | 30—Not keeping up bridge walls. |
| 10—Putting heats on pig. | 21—Failure to get tests to laboratory for preliminary analysis in plenty of time. | 31—Delays caused by broken pipe on doors and frames. |
| 11—Taking too long to melt down. | 22—Failure to keep the pit foreman informed of the progress of your heat, | 32—Delays due to duty premises, indirectly causing wrecks, broken engines or other accidents. |
| 12—Improper charging of limestone and scrap, ac- | | 33—Loafing near end of turn. |



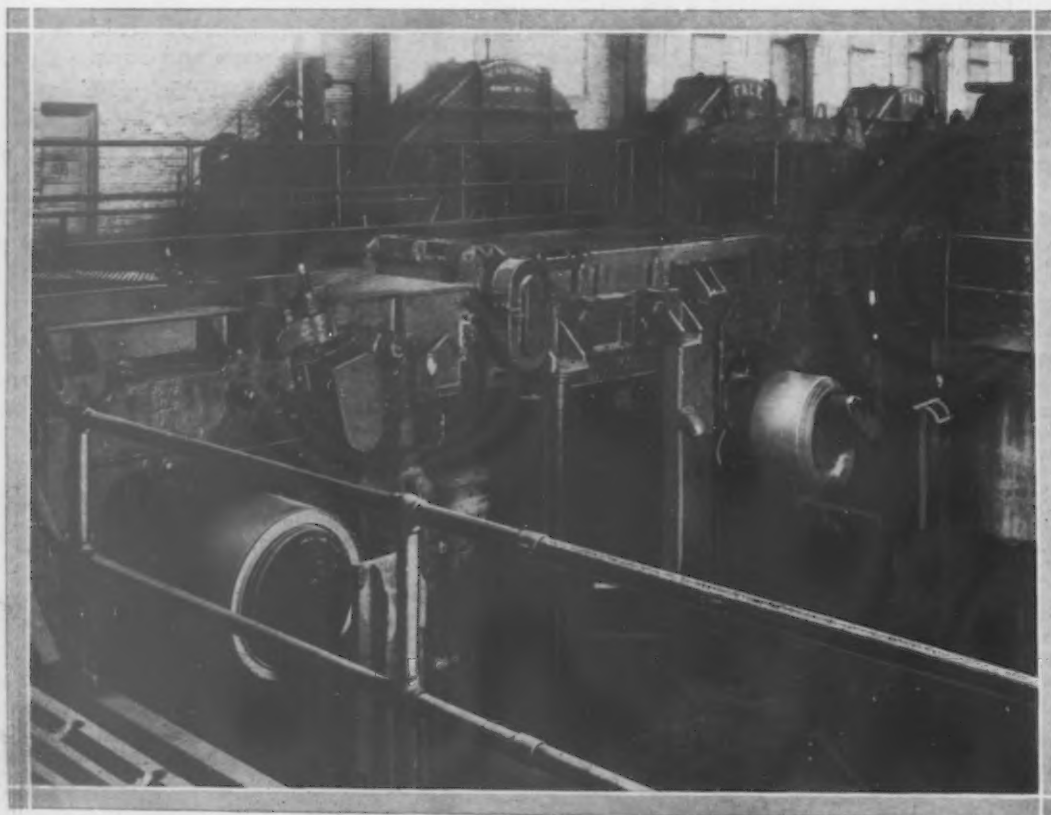
Gary Mill Designed for 25,000

THE Illinois Steel Co. has recently put into operation a 28-in. strip mill at its Gary, Ind., works. Of the semi-continuous type, the mill comprises seven two-high stands of rolls 24-in. in diameter, six two-high stands of 28-in. rolls, and two sets of vertical edging rolls, all of which are motor driven.

The new mill can produce strip steel up to 26 in. in width at the rate of 25,000 tons a month. It is designed of ample proportion and rigid construction

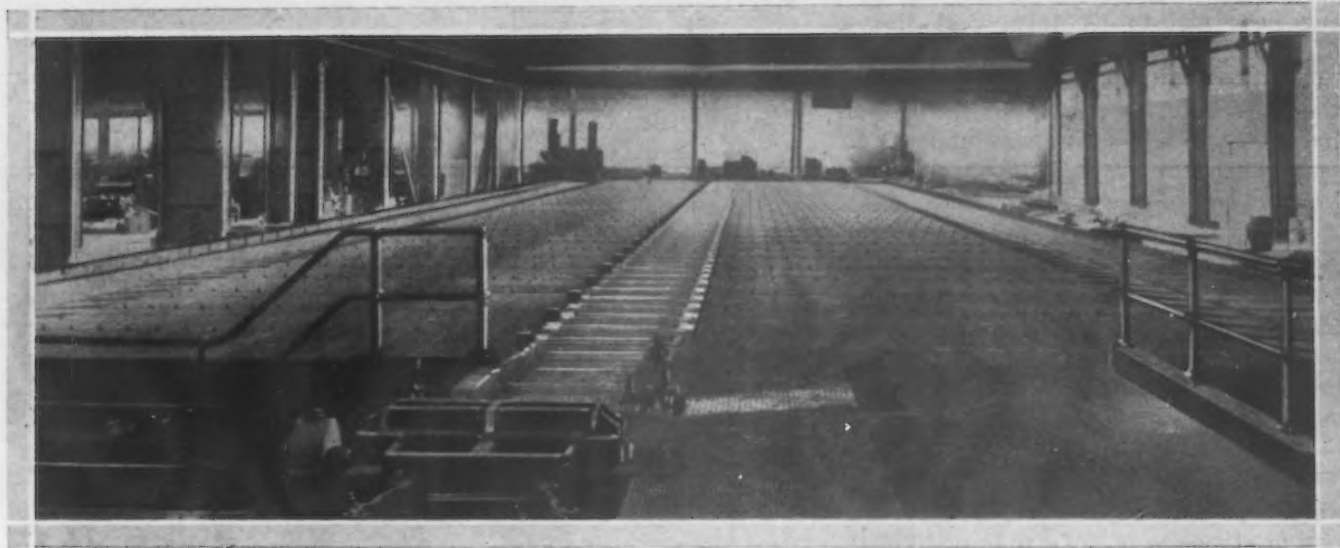
to insure accurate rolling and has sufficient passes to give a satisfactory surface finish. These two features are of outstanding importance, since the requirements of the trade in respect to surface finish and gage tolerance are severe.

The first pass is a heavy edging for rolling slabs to the desired width and removing scale. After the first flat pass, the bars are automatically turned over to effect the removal of the scale. A high pressure water system also has been installed to loosen and



PRODUCT requiring a high degree of ductility is tightly coiled after the last rolling pass (left)

A view of the finishing stands with the pit containing the coilers in the foreground is given at the top of the page



Tons a Month of 26-In. Strip

blow the scale from the surface of the bar and to chill the surface at some of the passes, thus to provide a hard, smooth finish when desired.

Slabs for the strip mill are stored in a yard at the east end of the merchant mill group. This yard is served by traveling cranes of 102-ft. span, each of which is equipped with two 7½-ton trolleys. Adjoining the yard on the west is the furnace building, 120 x 142 ft., containing three slab heating furnaces 16 ft. wide and 56 ft. long. Slabs are trans-

ferred from the storage yard to the furnaces by means of a 10-ton, 55½-ft. span crane equipped with lifting magnets. Coke oven gas, piped from the company's coke plant at the Gary works, is used for heating the slabs.

As a large tonnage of strip steel is needed for purposes requiring a high degree of ductility, complete or part annealing of the material is essential. The most economical way to do this is to coil the strips in tight coils immediately after the last roll-

THE first vertical edger, shown in the foreground, at right, is for establishing desired width to the slabs and for removing scale

That part of the product of this mill which is not coiled is run out on a cooling bed (top of page)



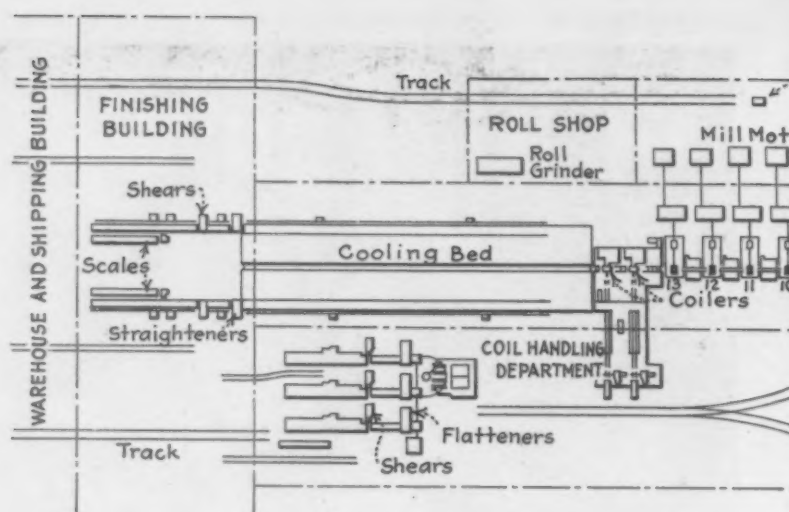
ing pass and to let them cool slowly. Therefore, two coilers have been installed in the runout table and conveyors carry the material from the coilers to the coil handling department, immediately adjacent for cooling, straightening and shearing.

Material which is not coiled is run from the last pass of rolls upon a cooling bed and is sheared into desired lengths. It moves into the finishing department, 105 x 175 ft., containing shears, shear tables and weighing scales. The department is served by traveling cranes of 102-ft. span, each having two 7½-ton trolleys.

Next to the finishing department is a warehouse and shipping department consisting of two bays 75 ft. wide and 175 ft. long commanded by cranes of 71-ft. 6-in. span, each equipped with two 5-ton trolleys.

The mill building proper is at the north end of the merchant mill group at the Gary works, containing 15 roll stands and a 200-ft. cooling bed and occupying a space 617 ft. long and 82 ft. wide. It is served by an overhead traveling crane of 77½ ft. span having a 40-ton main hoist and a 10-ton auxiliary hoist.

Directly north of the mill building is the motor room, 60 x 390 ft., with 12 mill motors ranging in size from 150 to 3000 hp. and three 4000-kw. and one 1500-kw. motor generator sets for supplying the mill motors with direct current. The motor room has a 30-ton traveling crane of 55½-ft. span. To the west of the motor room is a roll shop equipped with a roll grinding machine for grinding roll surfaces and roll necks.



Production follows a straight line from the billet

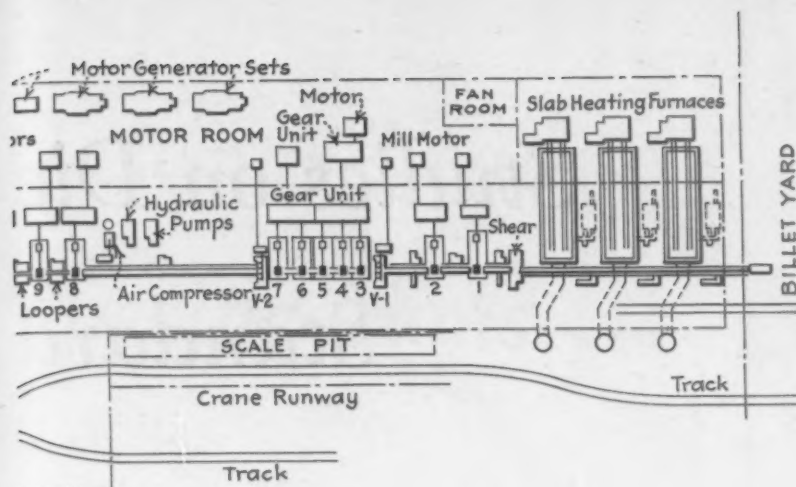
High Grade Slags from Manganiferous Iron Ores

Because of the importance of manganese in making steel and because of our limited deposits of ferro-grade ore requiring simple methods of beneficiation, the North Central Experiment Station of the United States Bureau of Mines, in cooperation with the University of Minnesota, Minneapolis, has been conducting an extensive investigation of methods whereby it will be possible to produce ferromanganese from our large deposits of manganiferous iron ore.

Recent tests conducted both in a small arc electric furnace and a small open-hearth furnace have shown that it is feasible to produce slags containing from 68 to 72 per cent manganous oxide, 6 to 10 per cent silica,



The coil handling department is equipped with flatteners and shears



yard to the warehouse and shipping building

under 0.2 per cent phosphorus, and 6 to 10 per cent ferrous oxide. Such slags are a decided improvement over those produced in previous tests. Further work with the electric furnace shows that it has several advantages over the open hearth for producing artificial ferro-grade ore from high-phosphorus spiegel.

Modified Bearing Bronzes

A study has been made at the Bureau of Standards of copper-tin-lead bronzes to determine the compositions best suited for bearings for various classes of service. Tests made included wear resistance, resistance to impact (single blow), Brinell hardness, and repeated pounding. The wear resistance tests were made on an Amsler machine under conditions of rolling friction at room and elevated temperatures without

the presence of lubricants. As no particular laboratory test will give all the information desired, it is necessary to study many types of tests to specify bearing compositions for definite conditions of service.

The effect of various additions to the copper-tin-lead alloys, namely, 4 per cent zinc, 0.05 per cent phosphorus, 2 per cent nickel, and 1 per cent antimony, was determined.

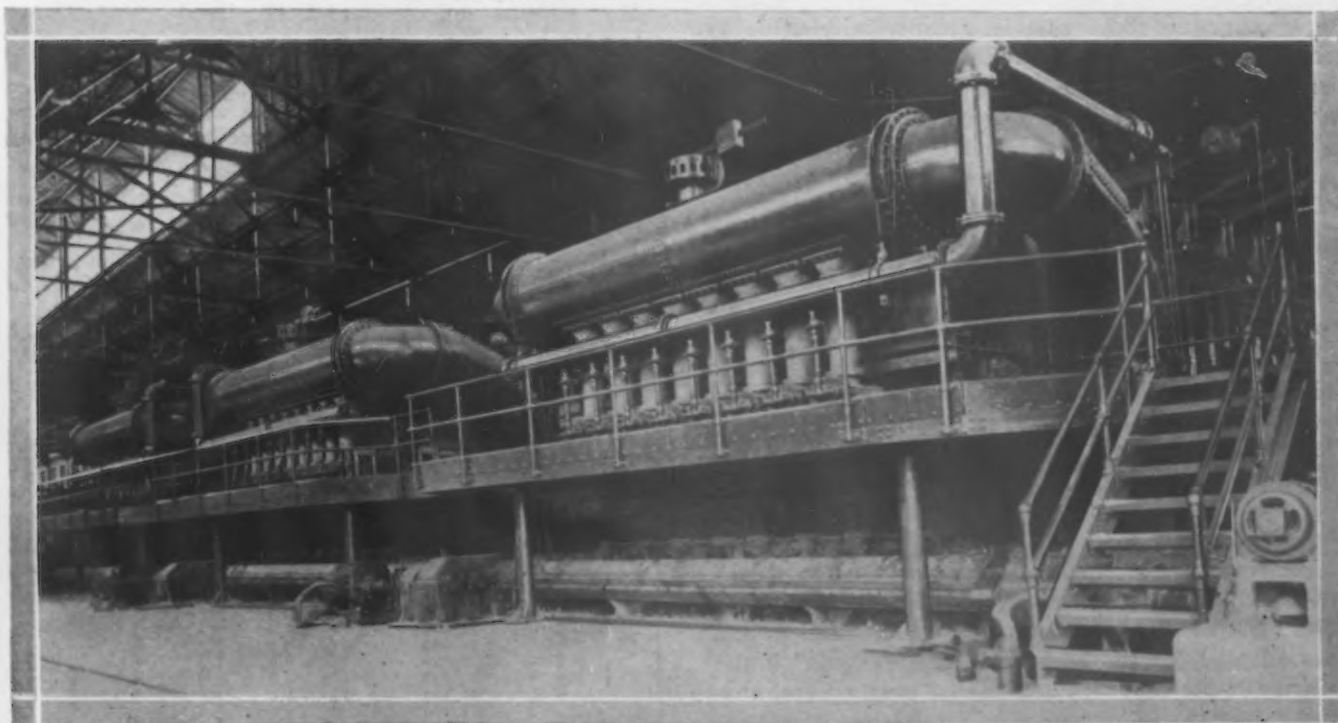
Bronzes containing 5 per cent lead or over are better suited to operate without lubrication than those containing no lead. Bronzes containing lead give good bearing properties probably because lead itself acts somewhat as a lubricant. This is not possible in bronze with only copper and tin.

Addition of 4 per cent zinc to copper-tin-lead alloys had no appreciable effect on wear resistance. It increased the pounding resistance at room temperature but had no appreciable effect at temperatures of 350 deg. Fahr. (175 deg. C.) and 600 deg. Fahr. (315 deg. C.) The tendency was toward increased hardness and increased resistance to impact.

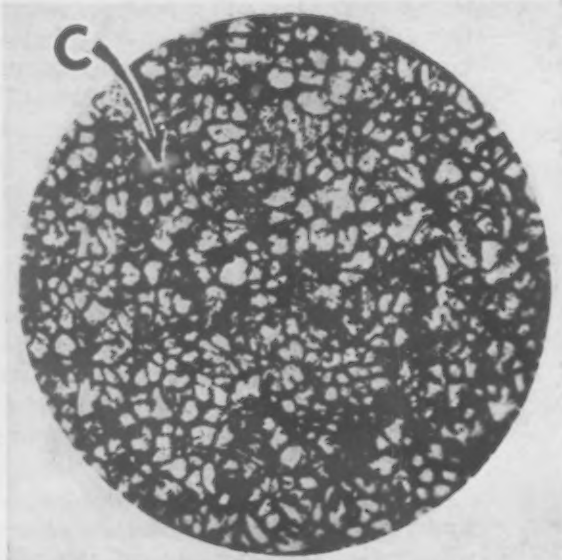
Phosphorus, when added in amounts of 0.05 per cent, also increases wear resistance and pounding resistance and has no appreciable effect on impact toughness, but slightly increases the Brinell hardness.

When 2 per cent nickel was present, there was a decrease in wear resistance but a marked increase in pounding resistance with no appreciable change in either Brinell hardness or impact toughness.

One per cent antimony was found to be undesirable from the standpoint of impact toughness and coefficient of friction but it increased the wear resistance, pounding resistance and hardness.



Coke oven gas is used for heating the slabs



SPECIMEN of 4 Per Cent Aluminum, 3 Per Cent Copper, 0.1 Per Cent Magnesium Alloy Die Cast in a Cool Die. Gray constituent is probably a copper rich phase. Other details are the same as in the other micrograph.

STUDIES on die castings were started in 1927 by a subcommittee of Committee B-2 (Non-Ferrous Metals and Alloys) of the American Society for Testing Materials. This work has been vigorously pushed by a steadily increasing number of cooperators and the group has now attained the status of a main committee, B-6, with H. A. Anderson, Western Electric Co., Chicago, as chairman, and P. V. Faragher, Aluminum Co. of America, Pittsburgh, as secretary. These men have directed the work in the past.

Twenty-one alloys cast in commercial routine by six producers are being studied in great detail. A mass of data on tensile strength, ductility, hardness, impact, density, accelerated corrosion, atmospheric exposure, and dimensional changes is being accumulated and is already sufficient in volume to have an important effect on commercial production.

Permanence of Zinc-Base Die Castings

It has been found that a minor impurity in the ingot metal going into zinc-base alloys has a wholly disproportionate effect on the permanence of the resulting die casting. Acceptance of this fact has led to the use of zinc of higher and higher purity. D. L. Colwell, Stewart Die Casting Co., Chicago, traced this development in a paper before the open session of the American Society for Testing Materials in Atlantic City, June 26. A few years ago "prime Western zinc" containing about 98.5 per cent zinc, was usually bought by die casters. High grade and electrolytic spelter with 99.9 per cent zinc then came on the market, and was adopted for the best work. "Horsehead" brand with 99.94 per cent zinc and special purity metal analyzing less than 0.02 per cent total impurities have now been recognized as being proper raw materials

Studies on Die Standard

where the best physical properties and greatest degree of permanence are required.

Mr. Colwell emphasized that zinc itself is not responsible for such things as increase in weight or volume, or impairment of tensile strength or toughness—common experiences which have frequently prevented the use of zinc-base die castings for exacting service. Among other data presented to substantiate this thesis, he exhibited a switch lever bar, cast in 1913, long before the advent of high purity zinc. It was carefully measured when manufactured and recent checks showed the following:

Original length of 0.472 in.; it is now 0.470 in.

Original width of boss of 0.204 in.; it is now 0.205 in.

Original diameter of pin hole of 0.220 in.; it is now 0.220 in.

Certain types, such as the high tin die-casting alloy, do not seem to require the highest grade of zinc; furthermore, an addition of 0.1 per cent magnesium to the commonly used 4 per cent aluminum, 3 per cent copper alloy appears to counteract the tendency to lose strength with age.

Corrosion vs. Phase Change

Much of the damage done to zinc-base die castings in the past has undoubtedly been due to corrosion by atmospheric agencies. Warm, moist air, with traces of sea salt, sulphur smoke or volatile trade wastes are particularly detrimental. However, some minor dimensional changes are due to a slow alteration in the microstructure of the alloys, in the opinion of W. M.

Physical Properties of Test Specimens Die Cast from Aluminum-Base Alloys

Alloy No.	Average Tensile Properties of 1/4-In. Round Bars		Average Charpy Impact on 1/4-In. Square Bars
	Ultimate Strength	Elongation in 2 In.	
1	30,000	4.0	6.5
2	35,000	2.0	3.5
3	37,000	1.5	2.0
4	29,000	3.0	5.0
5	32,000	1.5	2.5
6	30,000	3.0	4.5
7	32,000	2.0	2.5
8	30,000	4.0	5.0
9	33,000	1.5	2.0
11	32,000	2.0	3.0
12	33,000	2.0	3.5

Castings Lead to Specifications

Pierce, chief of metal research division, New Jersey Zinc Co., Palmerton, Pa.

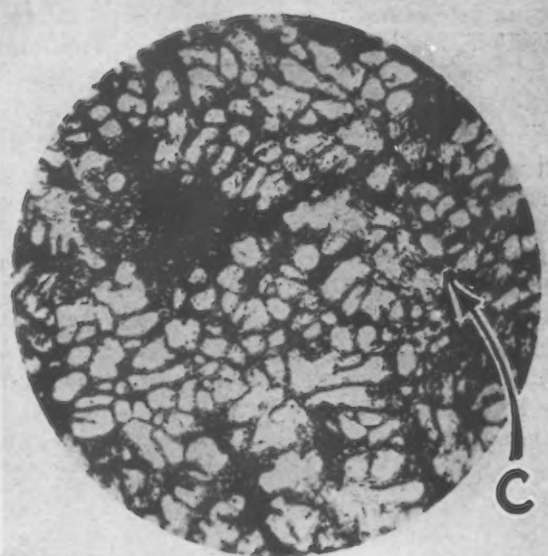
The micrographs show the structure of a common alloy, as cast in hot and cold dies. The light grains are alpha solid solution (zinc saturated with about 1 per cent of aluminum) probably containing some copper as well. The veinlets and background are a eutectic of alpha and beta constituent (the latter a zinc-aluminum compound or solid solution, about which there is yet much to learn). The gray particles marked C are probably of a copper-rich phase.

In pure aluminum-zinc alloys the beta phase in the eutectic transforms almost instantaneously into another phase (gamma) when heated through 270 deg. C., with decrease in volume and evolution of heat. Presence of other elements like copper, magnesium and nickel, as added to make the commercial die-casting alloys, prevent this transformation from occurring during casting, but cannot prevent it from taking place slowly at room temperatures, even though it takes the reaction several years to complete.

Studies are now under way to determine whether these alloys can be entirely stabilized by further modification of the composition or by heat treatment. The latter expedient is complicated by the circumstance that the strength of the die castings probably depends upon the presence of sub-microscopic particles throughout the alpha grains, and any extended heat treatment will affect the size and dispersion of these hardeners and therefore greatly modify the physical properties.

Specifications for Die Castings

Confidence in the trade in zinc base die castings has been restored to such an extent that Western Electric Co. and Packard Motor Car Co. are purchasing



SPECIMEN of 4 Per Cent Aluminum, 3 Per Cent Copper, 0.1 Per Cent Magnesium Alloy Die Cast in a Hot Die. The white constituent is alpha, a solid solution of copper and aluminum in zinc. The matrix is a eutectic of alpha (light) and beta, a zinc aluminum compound or solid solution (dark). It is the transformation of this dark constituent to alpha and gamma which principally accounts for aging changes. Magnification—500 diameters, etched with a solution of chromic acid and anhydrous sodium sulphate.

high-grade alloys under rigid requirements. The specifications call for zinc containing a maximum of 0.02 per cent impurities, and the finished castings having less than 0.005 per cent of lead, tin or cadmium. Castings of the 4 per cent aluminum, 2½ per cent copper and 0.10 per cent magnesium type must have the following physical properties:

	Average of Five Specimens	Minimum for Individual Specimen
Aged one week at normal temperature and humidity		
Tensile strength.....	40,000 or more	30,000
Elongation in 2 in.....	2.0 or more	0.5
Charpy impact (ft.-lb.).....	4.0 or more	2.0
Exposed one month to water vapor at 70 deg. C.....		
Tensile strength.....	35,000 or more	
Charpy impact.....	1.0 or more	
Expansion in any dimension (in. per in.)	0.0025 or less	

Studies on aluminum-base die castings have progressed to the point where consumers and producers

Chemical Compositions of Aluminum-Base Die Castings
Range in Compositions as Cast

Alloy No.	Nominal Compositions			Range in Compositions as Cast					
	Copper	Silicon	Nickel	Copper	Silicon	Nickel	Iron	Zinc	Magnesium
1	4	..	..	3.5 to 4.3	0.3 to 0.6	0.03 to 0.4	1.4 to 2.7	0.03 to 1.8	0.01 to 0.03
2	10	..	..	7.1 to 10.4	0.3 to 0.4	— to 0.05	1.4 to 3.0	0.05 to 0.2	0.01 to 0.1
3	14	..	..	11.9 to 14.2	0.2 to 0.5	— to 0.1	1.5 to 2.7	0.03 to 0.11	0.01 to 0.03
4	..	5	..	0.2 to 0.6	4.1 to 5.2	— to 0.2	1.2 to 2.5	— to 5.9	0.01 to 0.07
5	..	13	..	0.05 to 0.9	10.7 to 13.0	— to 0.08	1.3 to 4.3	0.03 to 0.9	0.01 to 0.1
6	2	3	..	1.9 to 2.2	3.0 to 5.0	— to 0.35	1.3 to 3.4	0.01 to 0.42	0.01 to 0.07
7	4	5	..	3.5 to 3.9	4.8 to 5.7	0.04 to 0.14	1.4 to 3.0	0.08 to 0.43	0.01 to 0.04
8	1.5	0.75	2.25	0.45 to 1.9	0.46 to 2.0	0.9 to 2.3	1.5 to 3.5	0.03 to 0.1	0.01 to 0.03
9	4	1.5	4	3.2 to 4.1	1.4 to 3.5	1.0 to 4.3	1.1 to 4.9	0.1 to 0.2	0.01 to 0.04
11	2	8	..	0.3 to 2.0	6.8 to 7.9	0.2 to 0.6	0.9 to 2.9	0.06 to 0.51	0.01 to 0.04
12	8	1	..	6.8 to 7.9	0.7 to 3.0	0.01 to 0.04	1.0 to 2.5	0.04 to 0.10	0.01 to 0.18

agree that usable specifications can be written. The adjoining tables show some characteristics of these alloys, as determined from test bars, die cast in regular production routine and under good metallurgical control.

Characteristics of Commercial Castings

It will be seen that alloys Nos. 1, 2, 3 and 12 cover the range of copper-aluminum from 4 to 14 per cent and the strength and ductility vary continuously through this series. These alloys, however, will show slight dimensional variation with aging at moderately elevated temperatures. Where alloys of the highest grade as to physical properties and permanence are required, alloys 4 to 11, inclusive, would be chosen. Alloy 8 (nominally 1.5 per cent copper, 0.75 per cent silicon, and 2.25 per cent nickel) has perhaps the best

combination of physical properties and dimensional stability, although it is a difficult alloy to cast and would be unsuitable for many complex parts.

The physical properties given are the arithmetical average of all test bars furnished to the committee. They show the relative merit of the alloys as to strength and ductility, but these figures cannot be used for design values. Physical properties of the completed casting depend upon its porosity, and this in turn is related to the wall thickness and the method of gating used by the die designer, as well as other circumstances met in production routine. It appears that the excellence of a casting can be judged by a combination of the values for specific gravity (soundness) and Rockwell hardness (strength), and this method of inspection appears to have considerable promise, involving as it does, non-destructive tests.

Worcester Steel Treathers Hold "Question Meeting"

SOME of the chapters of the American Society for Steel Treating occasionally hold "question meetings" during the year. A definite set of questions is listed on the program a month or so in advance with a member appointed to answer each question. Some of these meetings are very fruitful.

At the annual meeting of the Worcester (Mass.) chapter of the society this year such a meeting was held. Naturally the topics selected are not all in one field. A few of the important questions and answers are given in the following paragraphs as reported by the chapter's secretary, Milton H. Frommann:

Are Cooling Stresses Relieved in Cast Iron by Cold Work? Heat Treatment of Cast and Malleable Iron. Answered by John Schuster, of Rice, Barton & Fales.

Cooling stresses in cast iron can be relieved to some extent by some forms of cold working. The transverse strength of a test bar has been increased as much as 20 per cent by putting the bars through a tumbling mill, the explanation being that the vibration in the tumbler causes intermolecular rearrangement and shifting, which eases the stresses. These stresses are also relieved by annealing, and by aging, in which case, the same results are obtained.

Heat treatment is applied to gray iron, first, to relieve internal strains; second, to soften the casting. Annealing at 1400 to 1500 deg. Fahr. softens gray iron to a considerable extent. Annealing may be controlled so that hard castings can be made machinable, and still not lose too much strength. Light castings are generally placed in an oven while still red and permitted to soak to eliminate the normal chill, which would be present if permitted to cool too fast.

Heat treatment of malleable iron is necessary. By heating to 1600 to 1800 deg. Fahr. for four to five days in an oxidized packing for white heart malleable; two to three days for black heart mal-

leable, the cementite is broken up into graphite and ferrite. Case hardening of cast iron is something that the foundryman is not generally interested in. He is after a softer surface rather than a hard one, although a fairly good case can be produced by cyanide treatment when quenching.

What Causes Shrinkage in Cast Iron? Answered by Earl Clark, of Crompton & Knowles Loom Works.

The sand may be overtempered, or not have the proper moisture. This will cause the metal to boil, which will cause porosity.

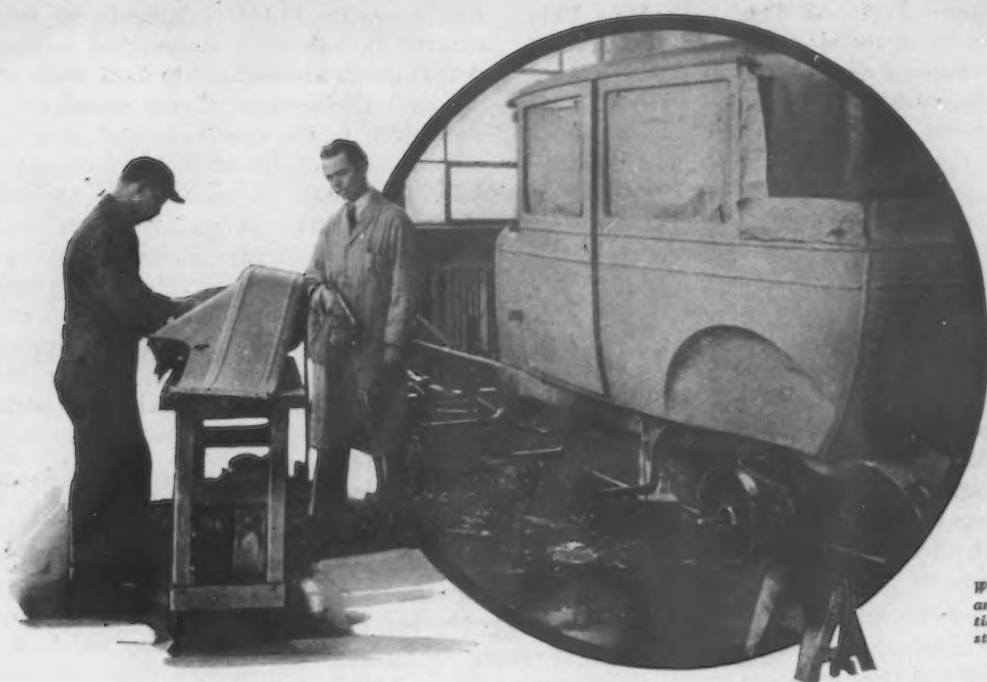
Silicon will aid in reducing shrinkage by the precipitation of graphitic carbon. Nickel will break up but will not eliminate shrinkage.

The mold should be made and gated to give the proper head. Risers should be placed correctly. Cooling very slowly so that there should be a precipitation of graphitic carbon, which gives less shrinkage.

Summing up: Shrinkage in cast iron may be partially eliminated, or brought to the minimum, by pouring the metal hot, maintaining the proper fluidity, and the correct time of pouring. If the casting is heavy in cross-sectional area, put in a small percentage of steel.

Nitriding and Its Cost. Answered by Fred Coonan, of Holy Cross College.

The steel, which contains about 1¼ per cent aluminum, 1.3 per cent chromium, and 0.25 per cent molybdenum, costs about 8c. per lb. The rough machining of the piece costs about 75 per cent more than regular case-hardening steel. In the nitriding operation itself, the labor to pack depends on the shop. The ammonia will cost about \$10.50 for 50 lb. For the time of 20 to 45 hr. in the furnace at a temperature of 970 to 1000 deg. Fahr. the cost depends on shop practice. All told the cost will be about 4c. a lb. more than carburizing.



Work on the Body and Chassis is Essential to a Full Understanding of Underlying Problems

What the Future Industrial Leaders Are Taught

By FAY LEONE FAUROTÉ*

THREE main divisions make up the program of study of the General Motors Institute of Technology as now organized, as follows:

- I. Full-Time Program,
- II. Part-Time Program,
- III. Extension Program.

Each of these three programs is in turn divided into a number of courses to meet the needs of the men. The full-time program of the Institute is divided into the following four courses:

I-A. Cooperative Engineering Course.—This is open to young men who have had a high school education or the equivalent. These students are selected by the divisions of General Motors from their employees, in cooperation with the Institute. Four years of training on the cooperative plan of alternate periods at the Institute and work in the plant is prescribed.

During the Institute periods the student is given a college-grade engineering training, with emphasis upon the production engineering and management phases of the automotive industry. During the plant periods the student follows an organized program of work in the factories, receiving wages which enable

him to pay a portion of the cost of this course. The aim of this course is to develop young men of promise for future responsibilities by giving training in both the theory of engineering and its practical application in the factories.

I-B. Buick Authorized Service Course.—This course is designed for men experienced in service, who are sent to the Institute for training by the branches and distributors of the Buick Motor Co. These men are given an intensive full-time course, extending over a period of 12 weeks, in the construction and maintenance of Buick cars and the principles and methods of operation and management of modern service stations.

I-C. Cooperative Service Course.—This program is designed for high school graduates employed by the divisions, or their distributors, and entered in this course by these organizations for training for future responsibilities in the service field of General Motors. One year is required to complete the course, as the student spends six months in an organized program of work in the factories and six months of training in the fundamentals underlying automobile construction and repair in the Institute, in alternate periods of four weeks each. The amount earned in the factory enables the student partially to defray his school expenses.

*In *THE IRON AGE* of Aug. 14, page 425, the author discussed the scope of the special training in the General Motors Institute of Technology. In a following article he covers the industrial purpose of the training.

I-D. Cooperative Technical Trades Course.—This is a two-year course in the more highly skilled trades, such as tool making and die making. It includes practical work on the machines used in the shops, following a regular procedure to insure a well-rounded experience, supplemented by a thorough technical training in subjects related to trade. Instruction is of high school grade, but more technical in character. The student is paid for his work during his periods in the plant, which helps to defray the cost to him of this course.

The part-time program, because of its nature, is available only to the employees of the General Motors divisions in Flint. It is organized in six departments, which offer complete programs of training covering one, two, three and four years of consecutive work. Each of these six departments is made up of a series of single-term courses, to complete which requires 12 weeks of study of two, four, or six hr. each week of class room, laboratory or shop work.

Part-Time Courses

II-A. The automotive department offers two courses: (a) A two-year course for the man who wishes to prepare himself for garage and service station repair work of a mechanical type; (b) A two-year course in automotive electricity for the

man who wants to specialize in repair work upon the electrical equipment of motor cars.

II-B. The Institute offers six four-year engineering courses: Industrial Engineering, Industrial Mechanical Engineering, Industrial Die Engineering, Industrial Body Engineering, Industrial Electrical Engineering, Industrial Metallurgical Engineering. The first two years are, with one or two exceptions, common to all six courses.

Since the interest and practical work of the students, particularly during the last two years of the course, will tend to be confined to a particular field of industry, the subjects covered during these years are correspondingly concentrated upon studies bearing directly upon that line of engineering endeavor, and are intended to supplement the practical work in which the student is engaged.

The limited number of hours available in evening or part-time school makes it impractical to give in

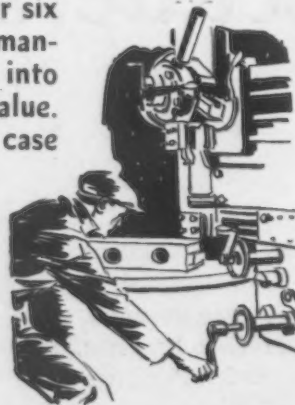
four years the broad training in its subjects usually covered in collegiate engineering courses. The fact that students are engaged in daily work which involves practical applications of the principles and instruction given in the classroom and laboratory, and the concentration of the student's attention to a narrow field, compensate to some extent for the shortening of the course. The courses have, therefore, been termed industrial engineering courses, to indicate that they are specialized courses. An effort is made to give a

thorough training in the subjects which form the foundation for successful work along the particular line in which the students are interested.

To Help a Man Overcome Handicaps

It is the aim of the department to give ambitious men who, for economic or other reasons, are unable to obtain a college education the technical training which, combined with their practical experience, will enable them to overcome the handicap of a lack of college training and to fit themselves for positions of responsibility in their chosen lines. The courses give a thorough groundwork in the fundamentals of engineering and shop work, the essentials of both theory and practice being so interwoven as to form a practical training for advancement.

The classes of instruction are conducted by men who are specialists in their chosen lines, yet men of broad training and wide experience. They are men who have had a technical education, who

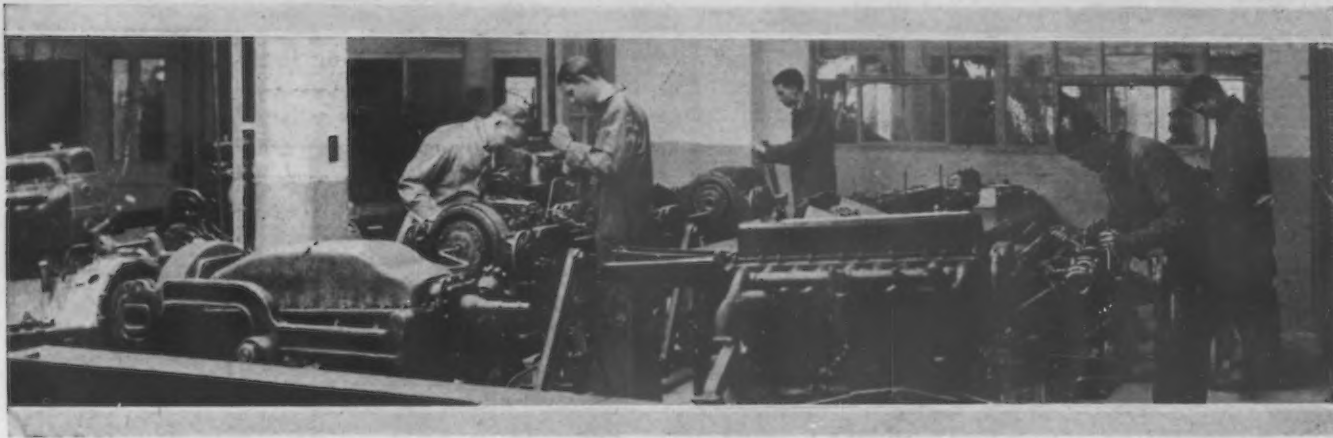


know the kinds of men wanted in the world of industry, and who therefore are able to judge what is best for the students and to present it in a practical manner.

Students in the engineering department are expected to take courses in the order given in the bulletin. Credit will be allowed, however, for subjects in which the student has had an equivalent training, either in previous study or in practical experience.

To provide the necessary basis to obtain the greatest benefit from specialization in the various engineering courses, the first two years (except in tool and body engineering courses) are devoted to a study of the principles of drawing, mathematics, physics, chemistry and mechanics. These years serve as a basis for later specialization.

II-C. Trades department—includes eleven different one and two-year courses, which give a thorough training to men wishing to become skilled workers in



Taking Motors Apart and Putting Them Together Again, at the Institute, Teaches a Man Much Which He Will Need Later

these trades: (a) machinists, (b) toolmakers, (c) patternmakers, (d) draftsmen, (e) sheet-metal workers, (f) acetylene welders, (g) electrical maintenance, (h) lathe, (i) milling machines, (j) grinding machines, (k) automatic machines.

II-D. Accounting department.—The principles of accounting form one of the foundation stones of modern business and industry. Three one-year courses and one special course are offered.

II-E. Foremanship-Management.—These courses are designed for men who are now foremen, for those of executive ability who are in line to become foremen, and for young men who wish to take a comprehensive training to prepare themselves for executive work in industry. Such subjects as these are included: Foremanship, factory organization, industrial economics, effective speaking, salesmanship, fundamentals of engineering and outlines of industrial development.

II-F. Industrial Training Department.—This includes a large number of part-time courses covering almost every phase of the automotive industry, intended principally for the men in the plants who need

short, intensive, specialized training. The classes meet once or twice a week, for one, two or three-hour sessions, for a period of 12 weeks. This program includes such courses as operation of the different types of machines and processes of motor car manufacture, pattern making, trimming, sheet-metal work, drafting, blue print reading, shop mathematics, mechanics, English and accounting. There are also special courses for girls, including such things as shorthand, typewriting, calculating machines, office practice and other allied subjects which the business woman would need in industry.

Extension Program

"The Institute has also developed a program of courses in such form as to make them available on what is practically an extension basis to employees of the divisions of the Corporation located in some 20 cities outside of Flint," says Major Sobey. "The program so far organized includes three courses for foremen: Department management, factory organization and economics of industry; and a course in outlines of industrial development, designed for foremen and for
(Concluded on page 517)



Students in "Buick Authorized Service" Course Making in the Shops the Parts They Are Expected to Know by Name and Number



BOOK REVIEWS



Who Should Be Laid Off?

Lay-off and Its Prevention. Prepared and published by the National Industrial Conference Board, New York. 86 pages, 5 $\frac{1}{4}$ x 9 in., with numerous forms and tables. Price \$1.50.

The principal problem discussed in this compilation, in the preparation of which the National Industrial Conference Board has been aided by many well-known persons having special knowledge and broad experience in this field, are the fluctuations in labor requirements, the methods of stabilizing the working force, the procedure with special reference to the choice of employees to be laid off, and the method of shortening the work week—whether by running fewer days or by shortening each work day—a third method being temporary shutdown.

One matter that would seem to have a special bearing on the question of whom to lay off, if any, and how to avoid suffering in case lay-off is necessary, is the so-called "comfortable scale of living," if it includes indulging in luxuries—usually bought on the instalment plan—without having provided for the inevitable rainy day. It would seem highly desirable for employers to impress upon their employees that it is more important to have a savings bank account, or building and loan shares, than to have radios, automobiles, fur coats and diamond rings—usually bought on credit, perhaps to be lost when only partially paid for.

The conclusions reached by this board, largely based on data received from its collaborators, are that the practice of indiscriminate discharge, if and when reduction of the working force is necessary, is no longer the general policy in American industry; increasing as it does the labor turnover and the training costs, intensifying the social problem of unemployment during slack seasons; so that the logical way to remedy a difficult labor situation brought about by seasonal fluctuations would be to remove the cause, or moderate the consequences.

The common method of regularizing plant operation is to estimate before hand the probable yearly output, distributing production equally among the 12 months of the year. This calls for having data and persons able to handle them intelligently; demands freedom from style factors; that the product be storable without loss and at low cost, and that the manufacturer can afford to tie up capital without embarrassment.

Another way is by diversification of product; a third, intensive advertising and sales efforts; and still further, there is the one of devising new uses for the product.

One constructive method is the training of workers, either formally or informally, for versatility. The extent to which this can be applied depends on the character of the manufacture—also of the employees.

Where it is absolutely necessary to curtail the work schedule, there are three factors to be considered, the first and most important being the value of the worker to the employer (this being sometimes the only factor to be considered), the worker's welfare and his ability to withstand long unemployment, and the welfare of the community. These factors have usually been weighed by the foremen; but the practice is growing to have individual records periodically compiled, representing the composite judgment of two or more competent supervisors.

Considerations collateral to the value of the employee to the employer are: length of service and the number of the worker's dependents. These two should be considered in connection with efficiency.

Questionnaires sent to about 200 companies and used in this report have yielded a mass of information and data that are here classified and reduced to percentages from every desirable standpoint, making the report highly useful as far as it concerns important manufacturers.

Unfortunately, however, these do not embrace 10 per cent of the number of factories that have to consider the question of laying off. All that their managers can do is to "read, mark, learn and inwardly digest" this important document, add some of their own data, and use judgment and human kindness.

A Study of Incentive Plans

Group Incentives: Some Variations in the Use of Group Bonus Work. By C. C. Balderston, Ph.D. 171 pages, 6 x 9 in., illustrated with tables and charts. University Press, Philadelphia. Price \$2.50.

The success of modern manufacture is usually based on incentives proportioned to performance; but as a rule work is considered as a unit independent of each man's mates doing exactly the same work; or others working in connection with him. More recently, however, group incentives, that some years back appeared only in connection with the contractor system, are being experimented with; but up to now there has been no careful study of the ways by which such incentives have been applied under various working conditions. Professor Balderston has made such a study, the main conclusions of which we have before us.

Group bonus differs in one thing from gang piece work by expressing the task in hours or in daily output; and its advocates claim therefore that the labor cost is not fixed, and that each individual's base rates can be independent of the other's.

There seems to be very marked difference of opinion among manufacturers as to the amount of standardization necessary before beginning incentive payment; some considering that all of the factors must be controlled before installing bonus, others thinking that after all superficial changes in methods and any expedient changes in equipment have been made, incentives may be used to stimulate output and encourage improvement. The author does not aid in deciding this point.

The reader gets some knowledge of the difference between the two systems on page 18, which treat of the determination and distribution of earnings, showing that, under gang piece work, group earnings are usually divided by assigning a base rate to each worker, and multiplying it by the number of hours worked; dividing the total piece work earnings according to individual base earnings. Under group bonus, each member of the group receives the same bonus percentage before it is applied to his individual base earnings.

The difficulties of the installation of group compensation are classified into those (1) resulting from the nature of the work (2) involved in setting labor standards (3) inherent in the plan as such, and (4) arising from the workers' attitude. The first is the most important; com-

prising the definitions of efficiency level, securing the proper sample of uncontrollable variations in the work itself and in the workers' skill and effort, frequent necessity of setting standard time for incentive payment by observing day workers; the establishment of suitable delay allowances in case of unbalanced jobs on conveyor work with varying products or output rate; and the keeping up of time standards in accordance with changes in methods or in equipment.

As to social effects, the author's conclusion is that, although subject to possible abuses, society is more likely to gain than to suffer from this system.

On Choosing a Plant Location

Plant Location. By W. Gerald Holmes. 275 pages; 6 x 9 in., illustrated. McGraw-Hill Publishing Co., New York. Price \$3.

In choosing a location for a manufacturing plant, too few consider that there are two elements involved: the technical and the economical. It is not merely a question of labor—kind, amount and price—freight rate on raw materials and products, power, purity of water, etc., but also one of markets, laws, taxes, wages, land values, etc.

This work takes up all the aspects of the problem, from choosing the general territory, the particular community and the site; trend of population and industry; using various industries as concrete examples; next goes into transportation, with particular reference to freight rates; then fuel and power, with tabularization of the coal- and gas-producing States; although much now true and important in this particular will disappear with electrical delivery of power from falling water and even from natural gas.

Labor and wages, especially of common labor, usually a fairly good indication of the cost of factory help, receive good treatment, although in the matter of comparison of Northern and Southern labor it is impossible to reach a conclusion satisfactory to all.

Chapter IX takes up the relationship between the labor market and the size of the community. The author seems content to dismiss labor organizations with two paragraphs.

Next, he takes up laws and taxation; giving a summary of State regulations pertaining to hours of work, minimum wage, minimum wage laws and taxation; giving a summary for manufacturing industries.

Following this comes a chapter on miscellaneous factors, narrowing the problem, such as climate, water, building costs, living costs, population, politics and local capital. The problem, of course, in last resource, is delivery of products to customers, commencing with so-called raw materials at their sources, and including every expense in placing the product unit at the prospective customer's door.

The author emphasizes the value of maps as locational working sheets, resembling a mechanical calculator, plotting the market according to its geographic localization and percentage distribution; showing the position of competitors and their comparative advantages at different points, position of raw material sources, and of transportation facilities, both rail and water; while marking out districts of advantage in labor and power and areas undesirable because of taxation or for other valid reasons.

Having considered all these elements, the next task is the treatment of choice of particular community, as regards size, labor supply, etc. The determination of labor requirements is gone into quite thoroughly—as ex-

ample, those for the cotton mill being given in great detail.

Electrical power receives a special chapter, considering the question of making or buying. Next follows transportation, with reference, for example, to the merchandise car or the package car.

As the community attitude is not to be neglected, this subject is given its own chapter. Finally, there are the general considerations, such as the civic aspects, government and taxes, financial institutions, internal transportation, and fire protection.

The book is good money's worth and time's worth.

ROBERT GRIMSHAW.

A review of the book "Standards and Standardization" written by Norman F. Harriman as appearing in THE IRON AGE of July 17, page 203, was incorrect with respect to the name of the publisher. It should have been stated that the book was published by the McGraw-Hill Book Co., New York.

New Books Received

Textbook of the Materials of Engineering. By Herbert F. Moore. 409 pages, 6 x 9½ in., illustrated. McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price \$4.

Ingenious Mechanisms for Designers and Inventors. 536 pages, 6¼ x 9¼ in., illustrated. Industrial Press, 148 Lafayette Street, New York. Price \$5.

Weld Design and Production. By Robert E. Kinkad. 108 pages, 6 x 8½ in., illustrated. Ronald Press Co., 15 East Twenty-sixth Street, New York. Price \$4.

The Iron Ores of Lake Superior. By Crowell & Murray, Inc. 340 pages, 6½ x 9½ in., illustrated. Penton Press Co., Cleveland.

Effect of Deoxidation on Carbon Steel Castings

With the increasing use of steel castings for industrial purposes, heavier demands as regards specifications are being made. Greater strength and ductility are required, foundrymen often being called on to produce castings having a minimum strength of 60,000 lb. per sq. in., a stretch of 24 per cent on a 2-in. gage, with a reduction in area of 35 per cent.

These properties can usually be obtained if castings are poured in dry or core sand molds. Green sand or moist sand molding, however, is usually desired for most work. With the customary moist sand molds, it is frequently found that "pin holes" occur at places where the moisture is trapped. If aluminum is added to the steel shortly before pouring (about 1 lb. per ton) the porosity trouble is usually overcome but the resulting castings will have lower ductility than if aluminum had not been added.

The Bureau of Standards has been studying the effect of many foundry variables upon the strength, ductility and soundness of steel castings. If the composition is maintained between 0.10 and 0.17 per cent carbon, the manganese between 0.60 and 0.70 per cent, and the silicon between 0.30 and 0.40 per cent, the addition of the customary aluminum shortly before pouring will give steel castings which are usually within the specified limits of ductility after the heat-treating operation.

Low Expansion Aluminum Piston Alloy

Regarded as Peculiarly Well Adapted for Use in Nickel Alloy Cast Cylinders

THE past year has witnessed the adoption of a new aluminum piston alloy by some of the leading manufacturers of aircraft, automobile, bus and marine motors. This alloy, developed by the Aluminum Co. of America as No. 132, is commonly known in the trade as Lo-Ex (meaning low expansion).

Contains 14 Per Cent Silicon

This new alloy, with approximately 14 per cent silicon and varying amounts of nickel, copper and magnesium, has a low coefficient of expansion, high thermal conductivity and superior bearing qualities. Its specific gravity is substantially less than that of the aluminum-copper alloy and about equal to that of pure aluminum. As a result of this excellent combination of properties, pistons cast in No. 132 alloy can be fitted with closer clearances, it is emphasized, form less carbon, and have a greater resistance to wear.

For some time there has been a demand for a light alloy piston which had a coefficient of expansion more nearly equal to that of the cast iron or steel cylinder in which it operates. Many methods have been devised to compensate for the greater expansivity of aluminum but these have been in the design of the piston rather than in the material from which it is cast. In the majority of the light alloy pistons now in use, the difference in expansivity has been taken care of either by means of a flexible design, or by casting nickel steel inserts into the piston structure in such a manner that the insert will partially control the expansion of the piston.

Both the flexible design and the invar strut piston have proved satisfactory from a commercial standpoint, and have become popular. However, as the No. 132 alloy has a coefficient of expansion of about 18 per cent less than that of the older aluminum-copper alloy, it strikes at the fundamental cause for the large clearances and permits a closer fitting of the piston.

Coefficient Same as Ni-Alloy Iron

The coefficient of expansion of No. 132 alloy and Ni-Resist, a comparatively new variety of cast iron containing nickel developed by the International Nickel Co., are almost identical. When pistons in this new low expansion alloy are used in motors having Ni-Resist removable sleeves, they may be fitted with the same small clearances which are employed with cast iron pistons operating in cast iron cylinder blocks.

While the low specific gravity of No. 132 alloy is a highly desirable feature in the pistons of any motor, it is especially so in aviation motors in which the pistons are necessarily

large and of heavy cross-section. In a 500-hp. radial motor, the use of this new low expansion piston material, in place of the older aluminum-copper piston alloy, reduces the total piston weight 3 lb. This reduction in the weight of the pistons makes possible a reduction of 1½ lb. in the counterbalances.

Easily Machined with Tungsten Carbide

Machining of properly heat-treated No. 132 alloy casting is accomplished on a commercial scale by the use of cemented tungsten carbide tools. The pistons may be ground on the same type of wheel commonly used for grinding other light alloy pistons. The wrist-pin holes of pistons cast in Lo-Ex must be finished with a diamond tool in order to secure the full benefit of No. 132 alloy as a wrist-pin bearing material. This is preferred practice with any aluminum piston alloy but is practically essential with No. 132 alloy.

Development of No. 132 or Lo-Ex alloy is the result of nearly eight years of intensive research work. During this time many alloy compositions were investigated. Alloys with lower coefficients of expansion were produced, but when pistons cast in them were given actual tests in service, it was found that they did not possess the combination of properties finally realized in No. 132 alloy.

Electric Brazing Equipment Uses Resistance Principle

A NEW line of electric brazing equipment, to have wide application in industry, is offered by the General Electric Co., Schenectady, N. Y. The method and equipment involved are simple and inexpensive, and have many advantages over other methods of joining metals, it is stated.

Brazing with this equipment is caused by the heat generated by the flow of electricity through carbon blocks. As these blocks offer high resistance to the flow of electricity, the heat generated is correspondingly high. Hence a small pressure suffices to complete the joint.

The equipment consists of a transformer, foot switch and tongs for holding the carbon blocks and work. The various parts to be brazed are either designed with flat surfaces to begin with, or are flattened before brazing. After the work is clamped in the tongs, flux is added and the current is turned on by pressing the foot switch.

When the flux melts, the brazing alloy is held against the hot metal until alloy flows into the joint by capillary attraction. During the proc-

ess of brazing the hot alloy dissolves a thin film of the metal surfaces, thus forming a new alloy rich in copper, and with a higher melting point than the original alloy.

Many advantages are claimed for this method over soldering. Less time is required, brazing is less expensive, and the conductivity, mechanical strength and durability are higher than those of the lead joint, it is asserted.

New Self-Lubricating Bearing Metal

UNUSUALLY high efficiency is claimed for the new bearing metal invented by W. C. Wilharm of the Westinghouse Research Laboratories, East Pittsburgh. Although self-lubricating these bearings can also be used with lubricant; in which case, if the supply, or film, of lubricant should for any reason become inadequate, the new bearing will resist the heating action of friction for a considerable length of time by means of its own lubricating qualities.

The bearing is made by mixing one or more metallic powders with one or more materials yielding a soapy substance. The ingredients are put in a cold mold and subjected to a pressure of approximately 40,000 lb. per sq. in. The temperature is gradually raised until it reaches about 400 deg. Fahr. After keeping the mold at this temperature for ½ hr., the pressure is raised to 200,000 lb. per sq. in. The pressure is then released, the mold allowed to cool, and the bearing finally removed. These bearings can be made to definite specifications, according to the mold used, or they can be made in blank and machined to the size desired. This permits low production cost where many bearings of the same size are required, and availability of many sizes with small stock where there is need for few bearings of various sizes.

New Small High-Speed Drill

INCREASED strength and ability to penetrate faster are attributed both to design and the special heat treatment given the Blue Diamond high-speed drill recently brought out by Whitman & Barnes, Inc., Detroit.

This drill is furnished only in jobbers sizes, 1-16 to ¼ in., by sixty-fourths, and in wire sizes, Nos. 1 to 55, inclusive. It takes its name from its bluish color.

Members of the Electric Hoist Manufacturers' Association report that the number of hoists ordered during July decreased 18.1 per cent, compared with the previous month, and the value of such orders decreased 4.07 per cent, compared with June, 1930. Shipments were 18.52 per cent smaller in July than they were in June, 1930.

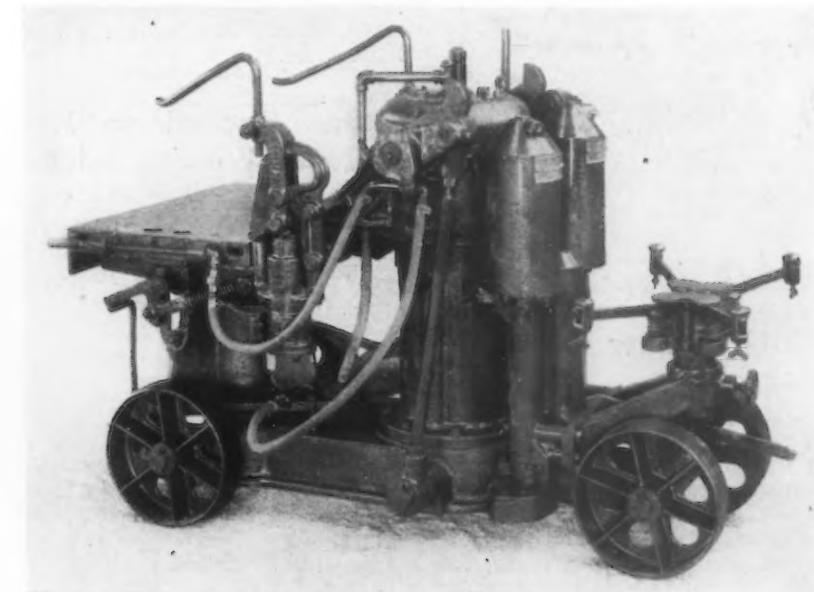
High-Production Molding Machine

Rollover and Pattern Draw Actuated by Air on Oil—
Automatic Features Increase Output

UNUSUAL speed of operation features the new plain-jarring, rollover, and pattern draw molding machine announced recently by the Tabor Mfg. Co., 6225 Tacony Street, Philadelphia. This machine has an 18x28-in. rollover plate, an 8-in. pattern draw, and is equipped with quick-acting air clamps and cradle elevator.

Rolling over of the mold is con-

trolled by air on oil, permitting maximum speed with safety. Under full load, the machine will roll over in 4.8 sec.; should a pipe line burst with the mold at the top of the arc, the mold would drop either way without endangering the machine.



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Pattern drawing is also controlled by air on oil. This eliminates all tendency to jump and permits controlling the speed of draw to suit the particular pattern used. The cradle elevator is mounted on ball bearings, fully incased and protected from sand, and requires no lubrication. This type of guide is said to be practically wear-proof, and the smooth and accurate operation obtained, coupled with the air-on-oil control, is emphasized as eliminating the necessity for patching molds, thus saving considerable time.

The leveling device is entirely automatic. With the mold rolled into the pattern drawing position, the cradle elevator is raised. As soon as the leveling device makes contact with the mold, the elevator stops automatically, with the leveling device locked in position to conform to the contour of the bottom board, holding the mold in the level position.

The air-operated flask clamps provided are practically instantaneous in operation.

Clamping and unclamping, rolling-over, drawing the pattern and rolling

speed without danger of sucking down the mold, the machine operating time for clamping, rolling over, unclamping, drawing the pattern and returning the rollover frame to the jarring position is only 15 seconds.

Oil-Regulating Valve With Close Adjustment

CLAIMED to give instant and positive regulation on any type oil burner, and with any grade of fuel oil at all operating pressures, a new oil-regulating valve known as the Microvernier has been developed by the Hauck Mfg. Co., Brooklyn, N. Y.

Increase or decrease in the oil flow is secured to a very fine degree, because one-tenth of a turn of the hand-operated regulating wheel moves a



sliding shoe 0.005 in. across an accurately machined, knife-edged opening. This knife-edged opening is triangular in shape when operating at small capacities, and therefore will pass sediment in the oil.

The valve setting is shown at all times by dial plate and index, which makes it easy to duplicate previous settings for certain heats, thereby saving time and fuel. Vibration is said to have no effect whatever on the Microvernier valve settings. Leakage is prevented, because the valve stem is packed and oscillates in a packing gland.

This valve is made entirely of bronze, except for the internal ring seat, which is of steel. The maximum capacities vary according to the oil pressure used. The valve is made in ¼-in., ½-in., ¾-in. and 1-in. sizes, for any volume up to 500 gal. an hour.

Power Transmission by the Multi-V-Drive

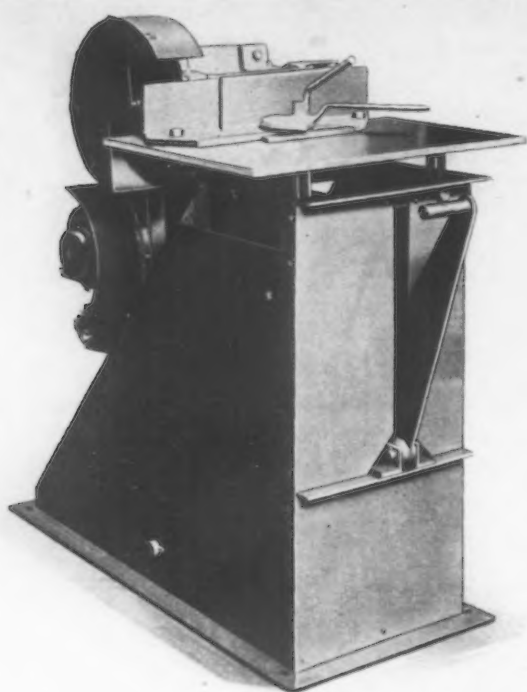
TO meet the demand for an economical, reliable, durable and simple means of power transmission, the Worthington Pump & Machinery Corporation, Harrison, N. J., has placed the Multi-V-Drive on the market. Developed in conjunction with the Goodyear Tire & Rubber Co. after months of study and experimentation, this drive consists of a number of endless molded V-belts running in V-grooved sheaves.

It combines a new long-life type of rubberized cord V-belt, impervious to dust and moisture, with an improved V-grooved sheave. The Goodyear Emerald cord belts used in this drive combine high power capacity, long flexing life, low stretch and accurate cross-section, it is stated. The load-carrying members are high-grade cotton cords arranged in parallel lines and concentrated about the neutral axis. Each belt takes an equal share of the transmitted load.

Each sheave is carefully grooved, machined and finished so that the grooves present a smooth surface on which the belts run. The wedging action between belts and grooves results in a slipless, powerful grip which compensates for, but differs from, initial belt tension in a flat belt drive.

The smooth-grooved construction of this drive, together with the fact that there is an exact mathematical relationship between the grooves and the molded shape of the V-belts, results in an effective conformity of belt to sheave which assures maximum power transmission efficiency, it is asserted. The combination gives a positive grip, without binding or backlash, which is said to transmit about 99 per cent of the applied power at high-speed ratios, over short centers without idlers.

Where this drive is used there can be no sudden breakdowns, it is declared, as each application is so engineered that, should one of the belts be ruptured, the remaining belts will carry the load until replacement is made.



SOLID Steel Sections from $\frac{1}{4}$ to $\frac{3}{8}$ -In. Round or Square Can Be Cut with the Toothed Blade, and Sections Slightly Larger with an Abrasive Disk. No coolant is required

New High-Speed Cut-Off Saw

A HIGH-SPEED cut-off saw, No. 00, is the latest addition to the Joseph T. Ryerson & Son, Chicago, line of high-speed metal-cutting saws. It is the smallest unit now offered, a small, light machine, for cutting light-gage steel molding and small shapes of non-ferrous material—brass, copper, aluminum, etc.

Solid steel sections from $\frac{1}{4}$ to $\frac{3}{8}$ in. round or square can be cut with the regular toothed blade. Sections slightly larger can be cut with the abrasive disk. Any aluminum or brass sections that will fit into the work table are quickly and easily cut.

No water or other coolant is required. The entire unit is built into

a rugged frame made of welded structural steel. The blade is mounted on an arbor carried by two heavy double-row self-aligning ball bearings.

Arbor is driven by a triple V-belt and 3-hp. motor. The table is adjustable up and down to obtain the most efficient cutting conditions for the blade. A convenient quick-operating clamp is provided for clamping shapes while cutting.

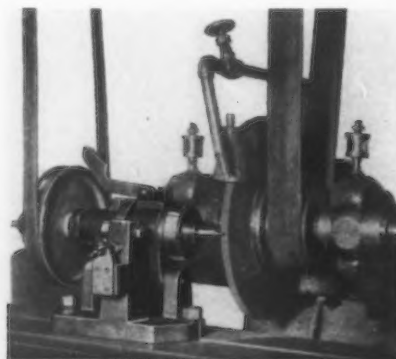
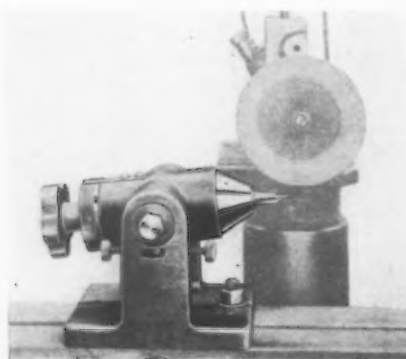
A hand lever eccentric moves the rear barrier toward the front, holding the stock tightly against the front barrier. The entire clamp may be set any angle up to 45 deg., for miter cutting. Guards completely inclose blade and V-belt drive.

Grinding Fixtures for Gear Tooth Chamferer

TWO grinding attachments for use with the Peerless gear tooth chamfering machine have been brought out by the City Machine & Tool Works, Dayton, Ohio. Used in conjunction with each other, these

attachments furnish the means of accurately grinding tooth chamfering cutters.

In the flute grinding attachment, shown in the left-hand illustration, the cutter is held by a collet in front



and indexed to each successive flute position by a ratchet spring arrangement in the rear.

The second fixture, below, at the right, is for grinding the relief. A cam arrangement is utilized so that the cutter moves back and forth in exact relationship to the grinding wheel. The set-up is made by placing the cutter loosely in the collet and bringing the arm over and setting it in the cutter flute before tightening the collet. After tightening the collet, the cutter is revolved by an indexing arrangement which is synchronized with the in-and-out motion produced by the cam mechanism. Claims for these fixtures include accuracy of grinding and removal of a minimum amount of metal, thereby increasing the life of the cutters.

Stellite Applied to Hand Truck Wearing Edge

THE manufacturer of the hand truck illustrated has standardized on the use of an abrasive-resistant for the wearing edge of the steel plate. The hard surfacing of the nose of this



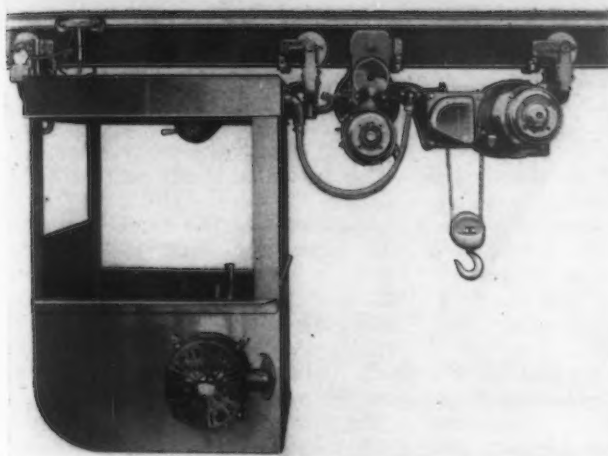
The Hard Surfacing of the Wearing Edge Increases the Life of This Equipment

truck is a part of the regular production process and is done to assure longer life of the equipment.

A band of Haynes Stellite about $\frac{3}{4}$ -in. wide is applied along the entire under side of the front edge of the steel plate 14 in. wide which forms the bottom of the truck. The abrasive resistant is applied to a thickness of about $\frac{1}{32}$ in. by means of an oxy-acetylene welding blowpipe. The steel plate rests on three supports to which it is secured by means of oxy-acetylene fillet welds.

Electrical industrial trucks and tractors shipped in July totaled 108, against 95 in June, according to the Department of Commerce. Shipments in the first seven months of the current year totaled 829 units, against 1271 in the corresponding period of last year.

Driver-Harris Co., Harrison, N. J., has been granted a melting license by the Krupp-Nirosta Co., Watervliet, N. Y., for the production of Krupp-Nirosta steel in the form of castings, rods, sheet, strip and wire.



THE Hoist Can Be Equipped with the Type of Control Best Suited to the Plant Layout

New Motor-Driven Trolley for Foundries

A NEW motor-driven trolley was shown to the foundry industry by the Loudon Machinery Co., Fairfield, Iowa, at the foundry exhibition in Cleveland last May. It is offered to foundries for the handling of hot iron, sand molds, flasks, pig, coke, castings and other materials. Its use in other industries will cover all handling from raw materials to finished parts, especially in straight line manufacture.

Rope, push-button, remote or dis-

patch control are available, permitting the trolley to be operated the way best suited to the layout. The cab is open or closed, or furnished with a step-on platform when the operator must frequently dismount. All gears are inclosed, and moving parts that do not run in oil are reached by high-pressure lubrication of the Alemite type. All rotating parts, including the motor, run on ball bearings. Hook capacity is up to 4000 lb.

Electric Oven May Be Operated in Sections

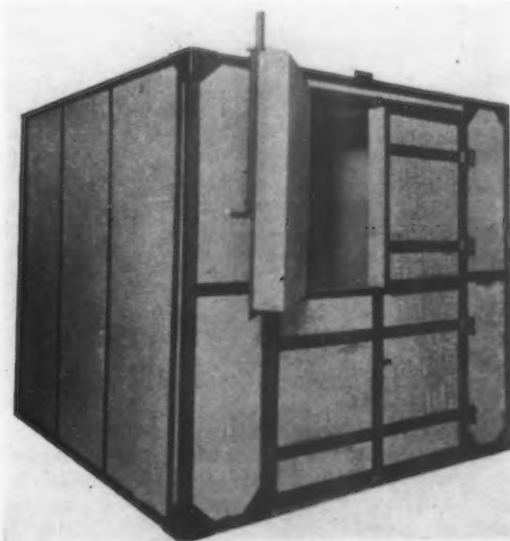
IF the drying of enamel finishes must be done on a more or less continuous process basis, an oven may be had with doors arranged so that there are four sections. By being able to open a section at a time, it is claimed by its maker, Harold E. Trent Co., Philadelphia, that heat losses are greatly reduced. The same design may be used for heat treating duralumin, or for drying out armatures and other electrical equipment.

Operating under automatic control

at 800 deg. Fahr., with three complete air-change cycles a minute, these ovens draw 28 kw. at 440 volts. They are 50 in. wide in the clear at the doors, 86 in. long and 75 in. high inside, and have heat-insulated walls of mineral wool 4 in. thick between sheets of metal resistant to high temperatures. All permanent joints are specially packed to prevent heat leakage.

Heating elements of an improved, continuously folded and formed ribbon

BY Opening One Section of the Oven at a Time, Heat Losses Are Markedly Reduced. This four-door oven may be used for drying enamel finishes, armatures and other electrical equipment and also for heat-treating duralumin.

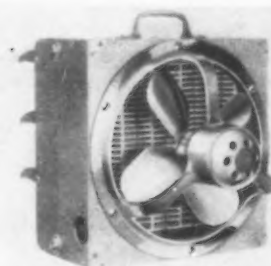


type are located near the floor. The heated air is drawn down through perforations the length of the center of the floor, up through a duct to the blower located on top, and outside of the oven. Discharge back into all parts of the chamber is made uniform by means of an ingenious deflector. Wastage of current is prevented by automatic switches, opening with the doors.

Electric Space Heater of New Design Offered

A NEW type of electric space heater for industrial and commercial heating needs has been placed on the market by the American Foundry Equipment Co., Mishawaka, Ind.

This unit combines the characteristics of both the steam unit heater



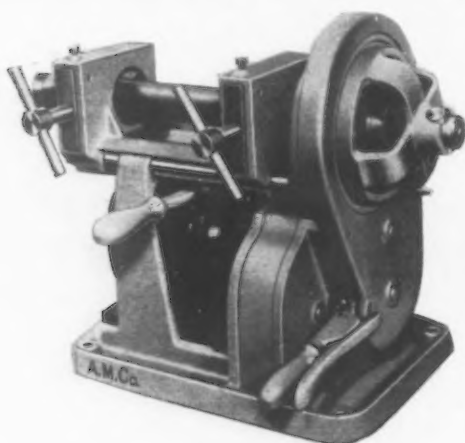
The Unit Combines the Characteristics of Both the Steam Unit Heater and the Electric Heater

and electric heater into one device. Its construction is simple. Special alloy heating strips are cast integrally with composite fins of aluminum alloy, making up into a single smooth casting that will allow an uninterrupted flow of air through its channels. Castings of this type are then assembled in suitable number and size into a cabinet, back of which a fan operates to circulate a current of air through the heated fins and out into space where heat is desired.

The American electric heater can be used for permanent installation or as a portable heating unit. It is particularly applicable for heating isolated and temporary buildings of every description, for intermittent heating needs in warm climates, for "off season" heating in temperate climates, for replacing impractically applied stoves and boilers, and for plants generating their own power or whose power rate is low.

Cuts Threads on Stationary Pipe

A NEW pipe-threading machine, designed for a wide range of uses, has been developed by the Axelson Mfg. Co., Ltd., Los Angeles. Its



operation is said to be simple and the machine to occupy a minimum of space. The pipe to be threaded remains stationary while the standard

square die is revolved, cutting the thread.

Long stands of assembled pipe or bent pipe may be conveniently threaded, as it is unnecessary to rotate the units. The work is gripped by two jaw chucks, which are practically automatic and instantaneous in action. Standard square dies, obtainable from practically any supply house, are readily adapted to the cutter thread.

Threads can be cut on material from $\frac{1}{2}$ in. to 2 in. in diameter and the power is supplied from a $\frac{1}{2}$ -hp. compound-wound motor, installed directly beneath the pipe holder brackets. Electric current of 110 or 120 volts, either 50 or 60-cycle, may be applied.

The manufacturer claims that the threader will cut at the rate of 17 r.p.m. on all sizes from $\frac{1}{2}$ in. to 2 in., and the required time for completing 11 threads is about 40 sec. After the thread is completed the dies are reversed and during this operation rotate at 34 r.p.m. Attachments are available for the cutter head to permit cutting off, reaming and bolt making.

Flexible Shaft Equipment Has Eight Speeds

USE of a patented V-disk speed changer that gives eight different speeds, ranging from 1000 to 11,000 r.p.m., is a feature of the flexible shaft equipment illustrated, which has been placed on the market by the United States Electrical Tool Co., Cincinnati.

The V-disk device permits speed variations to suit any tool or class of work, and is said to lengthen the life of the rotary files and grinding wheels used with such equipment. Change from one speed to another may be made in less than $\frac{1}{2}$ sec. A simple speed chart is furnished with the machine to facilitate selection of the proper tool and speed for different work and materials.

Both the shaft or core and the casing of this equipment are flexible. The casing expands and contracts, allowing for stress and absorbing the give and take usually thrown on the shaft. This is claimed to be an important advantage because it does away with the necessity of the shaft slipping to and from the motor while under power. Stress is further relieved by a slide coupling at the motor end of the casing.

The shaft or core is made of piano wire, wound cold under uniform tension, each layer wound in the opposite direction from the layer next to it, and progressing in size from the center to the outside to assure equally distributed torque. It is fastened rigidly to the motor, carries ample lubrication and has a coil bearing inserted between itself and the casing. The hand piece, which turns on ball bearings in a grease-tight compartment, is designed to assure easy han-

dling, accuracy, to run cool and free from vibration.

This flexible equipment is made in a range of sizes from $\frac{1}{4}$ to 3 hp., in-



The Eight Speeds Are Obtained Through the V-Disk Device. Speeds range from 1000 to 11,000 r.p.m.

clusive, and can be furnished in all styles of mounting, overhead or vertical, trolley, floor or stand, bench or horizontal.

Negotiations between the Allis-Chalmers Mfg. Co., Milwaukee, and the Amtorg Trading Corporation, New York, relative to a large order for tractors and farm equipment have been dropped, it was announced upon the return to Milwaukee of H. C. Merritt, manager of the tractor division of Allis-Chalmers.

Power Press for Light Stamping

AN improved power press for lighter stamping jobs has been put on the market by the Niagara Machine & Tool Works, 639 Northland Avenue, Buffalo. This No. 101 press has provision for quick attachment of motor bracket.

Application of this bracket converts the press from belt to individual belted motor drive. A self-adjusting ball-bearing idler keeps the belt under proper tension. This idler also increases the arc of belt contact on both pulley and flywheel, cutting down belt slippage to a minimum.

The motor bracket is of welded steel construction. Since the belted type of motor drive does not depend



Belt-Driven Light Press on Table Mounting. Insert shows motor bracket arrangement

upon motor dimensions, these standard motor brackets are made up in quantities, and carried in stock.

This press is small and rapid acting, being particularly convenient for light punching and forming operations in making buttons, small electrical pieces, jewelry, and the like.

No. 101 is the smallest press in the Niagara line. Shaft is of the eccentric type, fitted to hand-scraped bearings. Slide is guided by long V-shaped gibs. Motion of slide is controlled by foot-operated pin clutch of simple, durable design.

The press can be furnished for bench use, or table can be supplied for floor use.

American Iron and Steel Institute will hold its thirty-eighth general meeting at the Hotel Commodore, New York, on Oct. 24.

Indicators Still Fail to Forecast the Turn

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

ALL the statistical data concerning the steel industry pointed downward in July—at least when adjusted to allow for the usual seasonal variation. The general impression given by the statistics is that the industry has entered into a secondary period of a recession, somewhat as it did in the summer of 1924. Certainly it is disappointing to find that current trade reports indicate a further let-down in the first half of August, when some increase in activity is a normal seasonal expectation.

Production Index Low.

The average daily ingot output has declined more than seasonally, so that the adjusted index is now 77.1 per cent of "normal," against 91.4 per cent in June and 130.7 per cent a year ago. The 1927 bottom was represented by 86.6, while in 1924 and 1921 the low points were, respectively, 58.8 and 33.1. Thus the index shows the lowest annual rate of steel production since 1924, but is still considerably above the bottom levels of the preceding major recessions.

In spite of the sharp reduction in production (and presumably in shipments), the unfilled orders of the Steel Corporations increased only about 54,000 tons, which is a smaller percentage than normally. The adjusted index, accordingly, declined slightly. Under the circumstances this is not a favorable showing.

Meanwhile the trend of steel prices continued downward, THE IRON AGE index in July averaging the lowest since early 1922.

Pig iron production also continues its declining trend, but less rapidly than steel. It is relatively high, the adjusted index being 90.1 per cent of

"normal," against 99.9 in June and 130.1 a year ago. Pig iron production is clearly too large and much above its usual relation with the steel output. Further curtailment may safely be predicted.

Steel production, judged by available statistical data, exceeds requirements and steel prices are high in comparison with the general level of commodities. It looks very much as though the steel makers must find some way to reduce expenses in order to allow operation at lower price levels.

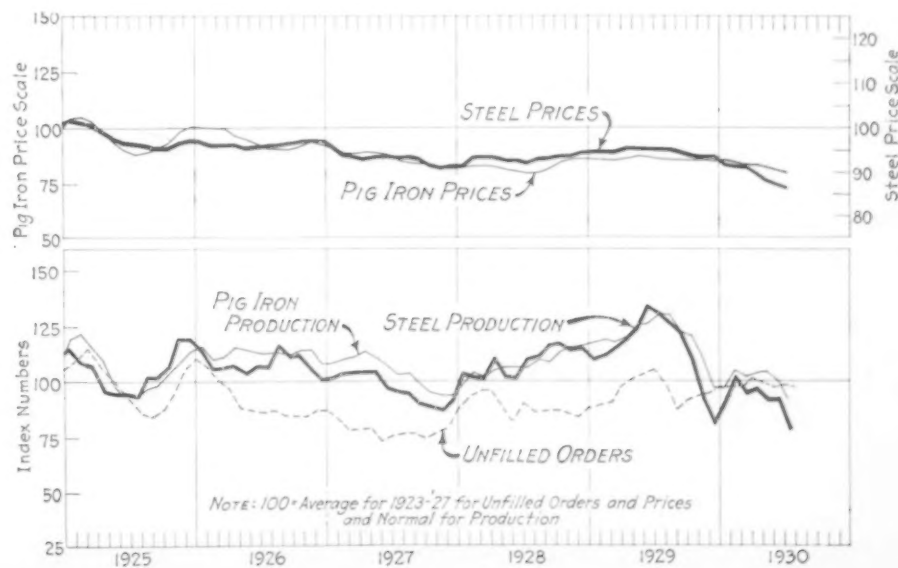
Price Maladjustments Persist.

There is a distinct maladjustment in the price structure. This is suggested by the fact that, compared with 1921-22, the prices of bars, billets, and scrap are considerably higher, while the prices of nails, sheets, and pig iron are lower. Several items of finished steel are extraordinarily low in price as compared with semi-finished steel. Pig iron and steel scrap, while low compared with post-war years, are very high in comparison with finished steel. As the production of pig iron is in excess of requirements, and our pig iron barometer points downward, further declines in this raw material are indicated. Steel scrap is nearer the post-war bottom than most items which have not already made new lows, and at present our scrap barometer does not indicate a decline.

It seems likely that wire rods and billets will show further declines before the end of September.

Sentiment is a factor in the steel market just as it is in the stock market, and experienced observers know that the steel industry can turn quickly. We merely point out that statistical indications, as yet, seem to afford no basis for any sustained improvement in the industry.

Steel Production Index Is Now at the Lowest Point Since 1924. Pig iron index is too high in relation to steel. Price reductions expected in pig iron and semi-finished steel



This Issue in Brief

Tumbling relieves cooling stresses in cast iron. Explanation: Vibration causes intermolecular rearrangement and shifting, which eases the stresses.—Page 494.

* * *

Oil opens the door to lower open-hearth fuel costs, says engineer. Present furnace is wasteful. A combination of gas and air ports will be designed to produce a high state of efficiency and combustion.—Page 486.

* * *

Watch your draft reversals carefully and your open-hearth fuel costs will be cut. Automatic timing will do during certain stages of the heat, says fuel engineer, but on the whole only careful supervision will avoid irregularity in operation.—Page 487.

* * *

Your chain drive will last longer if you check sprocket wheel alinement regularly. Side pull causes excessive wear on both chains and sprockets.—Page 480.

* * *

Excessive loss of ductility in green sand steel castings when aluminum is added can be avoided if composition is maintained between 0.10 and 0.17 per cent carbon, 0.60 and 0.70 per cent manganese, 0.30 and 0.40 per cent silicon.—Page 498.

* * *

Unlubricated bearing bronzes with 5 per cent lead last longer than copper and tin bronze. Lead acts as a lubricant. Adding 4 per cent zinc does not reduce wear resistance but increases pounding resistance at room temperature but not at 350 deg. Fahr. and higher.—Page 491.

New aluminum alloy expands under heat not much more than does cast iron. It contains 14 per cent silicon, high heat conductivity, and superior bearing qualities. Excellent for automobile motor pistons. Easily machined with tungsten - carbide tools.—Page 500.

* * *

Shrinkage in cast iron is minimized by pouring the metal hot, maintaining proper fluidity, and correct time of pouring. Silicon helps reduce shrinkage, so does slow cooling.—Page 494.

* * *

For satisfactory welding of ships, progress of welding must be arranged to avoid strains in seams, joints and flat surfaces. Allowance must be made for shrinkage.—Page 482.

* * *

Poor July record hinders construction industry's uphill struggle.—Contracts in 37 Eastern States amounted to three billion dollars for first seven months, 18 per cent under same period of 1929. But first half year was only 12 per cent under.—Page 477.

* * *

Aluminum alloy is rivalled in lightness and strength by steel wing beams for airplanes. Parts of chrome-molybdenum steel tubing are assembled in annealed condition and entire beam is heat-treated. Heat-treating increases cost but saves weight.—Page 485.

* * *

High strength at high temperatures is obtained in steel castings by adding small percentages of nickel and molybdenum. Superiority of carbon steels is considerable.—Page 484.

Buyers of strip steel demand good surface finish, uniform thickness. Product of new strip mill at Gary has both. Can make 25,000 tons of 26-in. strip each month. High ductility is obtained by tight coiling after last pass and slow cooling.—Page 489.

* * *

If your zinc-base die castings are to be "permanent" make certain that the ingot metal has high purity. Minor impurities have a wholly disproportionate effect on the durability of the die casting.—Page 492.

* * *

How to insure a hale and hearty old age for zinc-base die castings. Adding 0.1 per cent magnesium to the usual alloy appears to counteract the tendency to lose strength with age.—Page 492.

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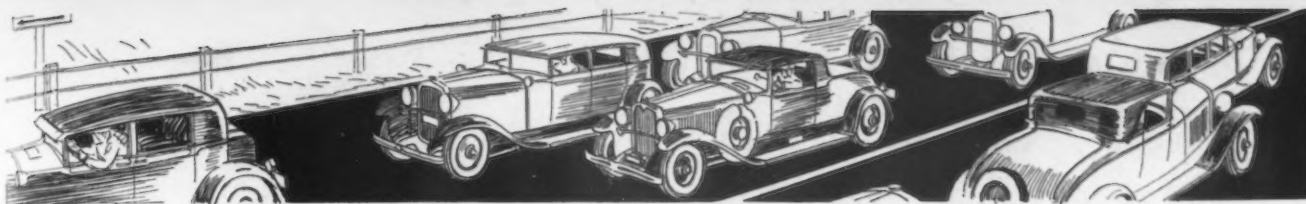
Group bonus is subject to possible abuses, investigator declares, but he believes society is more likely to gain than to suffer from its use.—Page 498.

* * *

For the ambitious who lack the means for a college education, General Motors provides industrial engineering training. Students may study full-time or part-time. Wages received for work done as a part of training course enable the student to pay a portion of the cost.—Page 495.

* * *

Welding proves successful in ship construction. Withstands severe tests, but riveting is recommended for continuous lengthwise seams in hull. Welded oil barge weighs 30 per cent less, carries 12 per cent greater load, than riveted vessel.—Page 482.



First Roadway of Steel Now Being Built in Illinois

STEEL foundations for public roads are declared by the American Highway Educational Bureau, Washington, to be the latest development in prospect in highway engineering. The bureau pointed out that, according to the view of road builders who have given the new development close study, the steel-based road heralds the coming of the real super-highway.

"The motoring public," said a statement issued by the bureau, "long familiar with unsightly cracks in rigid road surfaces, and the rutting and shoving of the softer types, may now have roads that will be at all times smooth, that, according to estimates, will last several times longer than pavements now in use, and over which traffic may move with increased safety at a speed ranging between 60 to 100 miles an hour."

First Test Road Being Built

The first test road embodying this new steel construction is being built on a section of the Sangamon County, Illinois, highway system. As explained by engineers, the road will have a carefully rolled and prepared subgrade on which the steel base and curb will be laid. Next will follow a mastic sand cushion upon which will be placed a layer of 2½-in., or 3-in., brick, with an asphaltic filler poured into the interstices between the brick. The result, it is declared, will be an indestructible base with a smooth riding surface built into the structure with sufficient flexibility to meet all changes in temperature without breaks or cracks on the surface.

Permission to construct this steel section has been granted by Frank T. Sheets, chief engineer of highways in Illinois, and the test road will be built under the supervision of Truman L. Platt, superintendent of highways in Sangamon County.

The statement said that for this new foundation a type of steel that would resist corrosion was essential and that the American Rolling Mill Co., Middletown, Ohio, will manufacture the steel for this first steel highway. The National Paving Brick Manufacturers' Association, in a statement on the subject, said that it is planned to use both plain and corrugated metal sheets, with curbs and stiffeners of various designs.

The brick will be furnished by the Poston-Springfield Brick Co., Springfield, Ill.

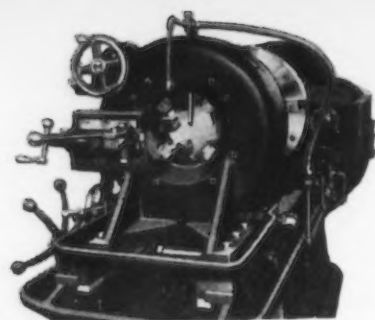
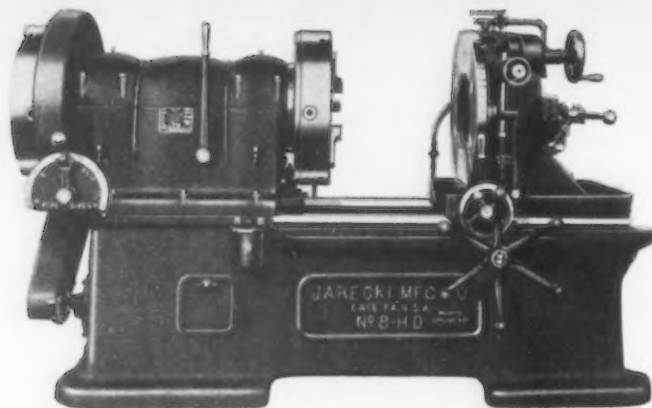
Dream of Steel Highways May Come True

"Steel is probably the most universally useful and important product of the world today, and it has always been a fond, even though vague, dream, that eventually there might be highways of steel," said the statement of the American Highway Educational Bureau. "However, there were problems to be solved, such as construction, proper traction for traffic, cost and life. It is generally conceded that steel would afford a construction which would have many advantages as to load-bearing strength and ease of laying. But many felt that a steel road could not be built at a price within reason. Also, that it would be difficult to secure proper traction when traffic was placed directly on a steel wearing surface.

"Steel engineers have attacked the problem and by means of extensive research and tests have developed a type of steel base construction, which, used in connection with a proper surfacing material, would not only give an exceptionally strong highway, but would permit a wearing surface of some flexible type such as asphalt, bituminous filled brick, etc., which would be ideal for the wheels of traffic.

"The problem of initial cost of such super-pavement has also been attacked by steel officials and engineers and by using certain methods of construction developed in their tests, they have been able to get the cost down to a price comparable to other present-day pavements of the higher types."

"The last word in road construction," said George F. Schlesinger, managing director of the National Paving Brick Manufacturers' Association, "has not yet been written. Indeed, it may still be far in the distance, but the road with a steel foundation topped with vitrified brick on a sand cushion and held in place by a flexible binding material between the brick certainly seems to have possibilities. It may be the answer to the motorist's quest for a road that has a smooth, resilient riding surface, and, best of all, a road that will make his gasoline tax and license fee investments well worth while.



THE Speed Change Dial of This Pipe Machine Gives Six Different Speeds. The automatic trigger at center of die opening is shown above

Fast Threading on New High-Speed Machine

INCREASED production, with lower operating costs and considerably lower die costs, is claimed for a new high-speed heavy-duty threader, brought out by the Jarecki Mfg. Co., Erie, Pa. The 8-in. machine gives an average threading speed of over 29 ft. a minute, and cuts off 8-in. pipe at the rate of over 100 ft. a minute. Machines of 4-in. and 6-in. sizes are built, also, and a 12-in. machine is to be added.

Exact duplication of threads, on every run, is said to be assured by the automatic self-opening die-head. A forged steel trigger, extending inside the die-head, automatically opens the dies when the correct length of thread has been cut. This trigger is quickly set for any length of thread desired, by means of a thread length dial on the die-head, which is calibrated in $\frac{1}{4}$ -in. and for Briggs standard. The trigger recedes completely out of the way when the chasers are open, returning again to position when the chasers are closed.

Small chasers, held rigidly in large die-holders, have proved more economical than large dies because of the considerable saving in tool steel. Chasers for the 8-in. machine are $2\frac{1}{4}$ -in. wide, providing ample width for cutting an 8-in. standard thread, which is 2.1 in. long.

To speed up the changing of chasers when changes in thread pitch occur, the new chasers are firmly clamped in three directions in the large steel holders, by means of one screw. The operator uses only a screw driver in taking out the tapered screw which clamps the chasers, and he can change a chaser in a few seconds.

It is not necessary to change chasers to thread any size pipe within the regular range of the machine, $2\frac{1}{2}$ -in. to 8-in. (eight threads). Chasers are changed only when the thread pitch changes—for example, when threading $1\frac{1}{2}$ -in. or 2-in. pipe ($11\frac{1}{2}$ threads).

No change of die-head is necessary when changing over the machine to pipe of a different size. The one self-opening die-head covers the entire

standard range of $2\frac{1}{2}$ in. to 8 in., as well as the extra range to $1\frac{1}{2}$ in.

A gear-driven reversible pump forces 16 qt. of clean oil a minute to the die-head. Streams of clean cutting oil bathe the cutting points of the chasers. The 9-in. spindle bearings are lubricated positively by means of a chain which brings oil from the reservoir. Cut steel gears are used exclusively, running in an oil bath.

Timken tapered roller bearings are used throughout the machine, reducing friction to a minimum.

Motors for Runout Tables and Conveyors

SPECIAL motors, designated Type M, for runout tables in steel and tube mills and for other conveyor work have been developed and built by the Reliance Electric & Engineering Co., Cleveland.

Each motor is provided with a single heavy welded-steel support so located that a pulley-type roller keyed to the motor shaft can rotate around the body of the motor. Various shaped rollers to suit the material to be conveyed can be used.

Motors with rollers are lined up in tandem, the distance between being governed by the material conveyed. An installation may require any number of units, depending on the distance

of travel and the roller spacing.

Motors are fully inclosed as protection from all injurious elements. They are provided with class B insulation— asbestos and mica, which will withstand extremely high temperatures. Large ball bearings carry the motor-rotor and load with an ample margin of safety.

Conveyors consisting of individual motors with rollers have the advantage of great flexibility. They can be changed or moved quickly with little effort. If a motor should fail, it will act as an idler roll and not hold up production. It is easy to replace a motor. Maintenance requirements are reduced, since there are no external gears, chains, pulleys, belts or other parts demanding attention.

Conveyors constructed with these individual motors and rollers are declared to be economical in power consumption, since the only bearings are those of the motors which, of course, are anti-friction bearings offering little resistance to rotation.

Inland Steel Co.'s New Bar Mill Completed

The Inland Steel Co.'s new merchant bar mill, which has been under construction for more than a year at the Indiana Harbor works, is now completed and ready for operations. This is Inland's third bar mill at that plant. Finishing on 10-in. rolls, this mill is equipped to produce the smaller sizes of rounds, flats, squares and shapes, as well as bands down to No. 12 gage and coiled material.

THE Welded-Steel Motor Support Permits Use of a Pulley-Type Roller Keyed to the Motor Shaft



Automobile Industry Cuts Prices to Stimulate Sales

DETROIT, Aug. 18.

DESPITE a much heralded increase in output of automobiles this month as compared with last, the outlook is not encouraging. Cars are not selling as they should and, unless an upturn in business occurs, the present low production rate again must be scaled downward.

The farm drought and the failure of industry to show signs of the beginning of a recovery have been paraded across the front pages of daily newspapers throughout the country with the result that people are nervous and overcautious. That this can go on without taking its toll of prospective automobile sales is expecting too much.

In an attempt to meet the problem now facing them, at least two makers have turned to a drastic reduction in prices. The Oakland-Pontiac division of General Motors was the first in the field to lower its general range of prices, but it was quickly followed by Hudson-Essex. Oakland cut the base price of its closed models \$150, and on other models the reduction ran as high as \$170. The Pontiac decrease is from \$80 to \$110. The statement accompanying the announcement declared that "by virtue of these reductions Oakland becomes America's lowest priced eight and the Pontiac big six invades the broadest section of the automobile market formerly dominated by four-cylinder cars and small sixes. These reductions are made because in the winter the factory will present two new cars which, while changed enough to classify as new models, will remain practically unchanged in appearance, size and design. The two new cars will have the same type engines used in the cars now offered."

Lower Prices to Move Stocks

IT is no secret that neither the Oakland nor Pontiac has had a successful year. Now that the Chevrolet is a six-cylinder car, many observers hold that the difference between the Pontiac and Chevrolet is so small that the differential asked for the former is too great a barrier for the sales force to leap. When the Chevrolet was a four-cylinder car, the problem was relatively simple; but the Pontiac has got the reputation of being a "glorified Chevrolet," and now that Chevrolet is offering so much for the customer's money, the Pontiac people have had tough sledding. Reports are that Pontiac stocks are

heavy, and the reduction in prices has been made to meet this situation. The Pontiac-Oakland division of General Motors was shut down for two weeks recently, but resumed light operations the early part of this month.

Sales of Hudson and Essex cars have been far below normal in recent months. However, the Hudson-Essex management has an enviable reputation as merchandisers and everyone close to the trade is looking for Hudson-Essex to snap out of its lethargy before long. The sharp drop in prices is in line with policies in past years, but at the same time it puts the Hudson into a new competitive price class. The new prices will apply to 1931 as well as the present models, according to the company's announcement. Just when Hudson-Essex will bring out its new line is not known, although many believe that, in view of the present unsatisfactory situation, the company will not wait until the turn of the year.

What Will Chevrolet Do?

REPORTS persist that Chevrolet is planning to place its activities on an even larger scale than heretofore by making a four-cylinder as well as a six-cylinder car the coming year. General Motors believes that Chevrolet is not getting all of the business possible in the low-priced field and therefore is preparing to compete more directly with Ford. In view of the fact that when Ford got into production on Model A, Chevrolet definitely abandoned the four-cylinder market, this report, if true, represents a change in sentiment. Although some think that it sounds absurd, the story is heard that Chevrolet will build a four-cylinder, front-wheel-drive car. Another report, on the contrary, is that the four-cylinder job will be much like the present car, except that it will have only four instead of six cylinders and will sell at a price which will put it directly into competition with Ford and the new American Austin.

It is understood that the new Chevrolet six will be out in December and will be 2 in. longer than the present car. If Chevrolet is to manufacture two cars, a four and a six, it may be that one of the cars will be manufactured in the Oakland-Pontiac plant at Pontiac. In fact, the statement that Chevrolet is getting ready to move some of its manufacturing activities from Flint to Pontiac has been going the rounds for some time.

In line with the speculation regard-

ing Chevrolet's contemplated intensive drive for a bigger share of the low-priced business, it is interesting to note that price reductions of \$40 have been made this week on all sport models in the Chevrolet six-passenger car line. These reductions apply to the sport roadster, sport coupe, club sedan and special sedan. The latest move brings the price range of the Chevrolet six to less than the range of the four at the time of the change-over at the end of 1928. At that time the four sold at \$495 to \$715, while nine different passenger models in the six-cylinder line now range from \$495 to only \$685.

What of the American Austin?

DEMAND for the new American Austin is said to be fully up to the company's expectations. Production has been increased to about 175 cars a day at the Butler, Pa., plant and the company is reported to be planning the erection of a body factory adjoining its present assembly plant. At present bodies are hauled by truck from Grand Rapids, Mich., to Detroit, shipped by water to Cleveland, and then taken the rest of the journey to Butler by truck. The company is making a special effort to cut into the delivery field where fleets of cars are operated. The Austin's low upkeep, small parking space requirement, low selling price and good performance are being relied upon to sell it. Engineers of other automobile companies are reported to have torn down the Austin to discover its weak points and most of them are amazed at its ruggedness and general performance. Naturally Ford and Chevrolet are watching closely Austin activities and it would be interesting to know just what their reaction is. One thing is sure. If Austin competition becomes troublesome, Ford and Chevrolet can be counted upon to move speedily to meet the situation.

Production About 70,000 Cars

AUTOMOBILE production the past week is estimated at close to 70,000 cars. Ford is operating four days a week, with an output of from 6500 to 7000 cars a day. Chevrolet also is on a four-day basis, averaging perhaps 3500 cars a day. Chrysler is turning out slightly under 1000 cars a week, De Soto 300 and Dodge 900. Plymouth is on a schedule calling for 1400 to 1500 cars weekly. Buick is showing unusual vigor, going along steadily on 900 cars a day. It is early yet to tell what Buick will

be able to do with its new eight, but critics are unanimous in saying that it is the best car that Buick has offered in years. Studebaker is holding to 300 units daily on a five-day week. A survey of other makers reveals Willys-Overland at 280 a day, Nash 325, Hupmobile 170, Packard 115, Graham-Paige 110, Marmon-Roosevelt 50, and Cadillac 105. All of these companies are operating five days a week. Oakland-Pontiac and Oldsmobile-Viking divisions of General Motors are reported to be doing little.

Steel Prices Weak

Steel prices in the Detroit district have suffered from the willingness of some mills to take sheet and strip steel business at unusually low figures. In an effort to support the already low rate of operations, certain producers have seen fit to take tonnages from automobile plants at substantial concessions. Some mills,

of course, have had the courage to refrain from participating in these transactions, but at the cost of losing orders from customers who have long been with them.

The Trend Toward Low-Priced Cars

THE fact that Ford and Chevrolet have been making 65 to 70 per cent of the automobiles this year has long been common knowledge. Some observers believe that the two leaders not only will hold their places at the head of the list, but also will manufacture an even higher percentage. The dullness of the market for the Pontiac, Essex and other cars in the price bracket immediately above Ford and Chevrolet is taken as proof by many observers of the damage which is being done. There is no doubt that these two makers have contributed much to intensifying the competition which other companies have been compelled to meet.

Ford Buys Wabana Ore for Plant in England

MONTREAL, Aug. 19.—The Ford Motor Co. has closed a contract with the Dominion Iron & Steel Co., Sydney, N. S., for a large tonnage of iron ore to be shipped from the company's mine at Wabana, Newfoundland, to the new Ford works at Dagenham, England. Shipment arrangements are now being made. Steamers have been chartered to take 32,000 tons during October and November, 1931, and 80,000 tons from May to November, 1932. Special quays will be constructed on the Thames to facilitate the unloading of the ore and will be equipped with rapid unloading equipment.

In connection with its extended export program, the Dominion Iron & Steel Co. has completed a new agreement with the Newfoundland government under which the company will be exempt for 20 years from the payment of export royalties on all ore shipped in excess of 1,500,000 tons annually. The royalty on the first 1,000,000 tons will be 10c. a ton and on the 500,000 tons, 3c. a ton.

Wabana ore shipments have averaged around 1,500,000 tons annually, and under the new arrangements it is intimated that output may be doubled. In the past the ore has been shipped chiefly to Germany and the company's own works at Sydney, N. S., with some tonnage going to the United States. Since the opening of navigation June 9, shipments have totaled 332,567 tons, of which 173,176 tons went to Sydney, N. S.; 149,151 tons to Rotterdam, and 10,240 tons to the United States.

Activated Alumina for Drying Gases

Activated alumina, a specially prepared, partially dehydrated aluminum trihydrate in the form of hard porous masses, has been developed recently by the Aluminum research laboratories of the Aluminum Co. of America. Prior to the development of this new form, alumina was obtainable commercially only as a powder manufactured by the Bayer process or as a slag produced by electrothermal processes. Preparation of the mate-

rial in the form of hard masses permits of grading into sizes ranging from a powder to pieces approximating 1½ in. in diameter.

Affinity of activated alumina for vapors may be illustrated by its ability to adsorb moisture. It will remove 100 per cent of the moisture from air and other gases until it has adsorbed between 8 and 12 per cent of its weight. Furthermore, it will continue to adsorb moisture at lower efficiencies until it has taken up from 20 to 25 per cent of its weight. The complete removal of moisture is of particular interest in the liquefaction of gases and where the presence of a small quantity of moisture in gases causes corrosion, explosive hazard or limits the reactivity of the gas. Other typical drying applications are air conditioning, the drying of blast, the dehydration of ammonia, oxygen, etc.

After activated alumina has adsorbed a particular vapor or gas to capacity, it has been demonstrated that heating the material in any manner to temperatures between 200 to 700 deg. Fahr. will eliminate the adsorbed substance. Cycles of adsorption and reactivation have been performed more than 1000 times without any detectable effect on its adsorptive efficiency or physical properties.

Chairmen at Sessions During National Metal Congress

Dr. Albert Sauveur, professor of metallurgy and metallography at Harvard University, has been announced as chairman of the meeting of the American Society for Steel Treating in Chicago, Wednesday morning, Sept. 24, during the National Metal Congress. The annual Campbell Memorial Lecture will be given at this time by Dr. M. A. Grossmann, Republic Steel Corporation, Massillon, Ohio, who will discuss, "Oxygen in Steel."

Others who have accepted chairmanships at the A. S. S. T. convention sessions are:

H. W. Gillett, director, Battelle Memorial Institute, Columbus, Ohio; H. J. French, International Nickel Co., Bayonne, N. J.; Donald G. Clark, director of sales, Firth-Sterling Steel Co., McKeesport, Pa.; J. Fletcher Harper, Allis-Chalmers Mfg. Co., Milwaukee; G. B. Waterhouse, Massachusetts Institute of Technology, Cambridge, Mass.; Jerome Strauss, Vanadium Corporation of America, Bridgeville, Pa.; C. H. Herty, Jr., U. S. Bureau of Mines, Pittsburgh; V. O. Homerberg, Massachusetts Institute of Technology, Cambridge, Mass.; E. C. Bain, U. S. Steel Corporation, Kearny, N. J.

Vice-chairmen will be: Frances H. Clark, Western Union Telegraph Co., New York; A. H. d'Arcambal, Pratt & Whitney Co., Hartford, Conn.; E. F. Cone, THE IRON AGE, New York; R. S. Archer, Aluminum Co. of America, Cleveland; J. R. Adams, The Midvale Co., Nicetown, Philadelphia; V. T. Malcolm, Chapman Valve Mfg. Co., Indian Orchard, Mass.

Fabricated Steel Plate Orders

	(Net Tons)		
	June, 1930	May, 1930	June, 1929
Total orders.....	35,014	30,306	45,918
Per cent of capacity.....	45.9	38.3	57.5
Total, six months.....	221,216 (a)	.....	284,813
Subdivision of orders:			
Oil storage tanks.....	9,741 (b)	9,222	6,890
Refinery materials and equipment...	5,744 (c)	3,787	4,383
Tank cars.....	1,701	1,329	1,998
Gas holders.....	1,627 (d)	2,314	5,444 (e)
Blast furnaces.....	511	426	1,003
Stacks and miscellaneous.....	15,690	13,228	26,200 (f)

From United States Department of Commerce.

(a) Smallest since 1925.

(b) Largest since last September.

(c) Largest since last January.

(d) Smallest since last December.

(e) This has been exceeded, since then, only once—6489 tons, in April.

(f) Not exceeded since then.

PERSONALS

H. J. FREYN, president, Freyn Engineering Co., Chicago, sailed for Europe on Aug. 21, en route to England, Germany and the U. S. S. R. He will visit the Leningrad organization of his company in connection with the consultation services it is rendering to the Soviet iron and steel industry.

R. G. CLARK has been appointed sales manager of the Riehle Brothers Testing Machine Co., Philadelphia. He was formerly with the Earl A. Buckley Organization, Philadelphia, and prior thereto with the Eugene McGuckin Advertising Agency.

JOSEPH P. TAYLOR, consultant in machine shop practice of the Midvale Co., has retired. He was graduated from Worcester Polytechnic Institute in 1891 and spent some time in the shops of the Michigan Central Railroad Co. before becoming identified with the Midvale Co. in 1898.

M. I. SHEA and GEORGE E. CLIFFORD have been appointed assistant managers of the pipe division of the Republic Steel Corporation. Mr. Shea has been identified with the pipe division of the sales department for 13 years. Mr. Clifford until Aug. 1 was manager of the Pittsburgh division of the A. M. Byers Co.

C. A. PORTMAN has been appointed general manager of the Illinois Iron & Bolt Co., Carpentersville, Ill. He was associated at one time in an executive capacity with the American Can Co. and more recently was general manager, for 10 years, of the Oliver Plow Co., South Bend, Ind. A year ago he moved to Upland, Cal., where he made his home until appointed to his new duties on Aug. 4.

GEORGE A. MORISON, vice-president and treasurer of the Bucyrus-Erie Co., South Milwaukee, Wis., has resigned as treasurer, remaining as vice-president in charge of finance, commercial and corporation matters, in which office he will resume active duties upon his return from a vacation trip to Europe. JOHN G. MILLER, formerly manager of domestic sales, has been elected treasurer, effective Oct. 1, and P. H. BIRCKHEAD, formerly assistant, is now manager of domestic sales.

ERNST STANDFUSS, vice-president and general works manager of the Harnischfeger Corporation, Milwaukee, has returned from a visit of six weeks in Europe.

GEORGE S. WHYTE, president, MacWhyte Co., Kenosha, Wis., manufacturer of wire rope, cable, etc., has returned from a tour of the Continent.

F. K. SMITH has resigned his connection with the Republic Steel Corporation. He was vice-president and treasurer of the Donner Steel Co. when that company became a part of the Republic organization and then served as president until the merger was completed, since which time he has been serving as special sales representative at Buffalo.

T. R. LANGAN has been appointed assistant northeastern district manager for the Westinghouse Electric & Mfg. Co., East Pittsburgh, with headquarters at New York. He has been identified with the Westinghouse company for more than 20 years, having started as an apprentice in the engineering department and advanced through the construction, service and sales departments to the management of the transportation division in the northeastern district. He will retain this position in addition to his new responsibilities.

American Steel Plant Engineers Go to Russia

The second field party of Arthur G. McKee & Co., Cleveland, has sailed for Magnitostroy, Russia, where the company will supervise the construction of a \$200,000,000 steel works and mine development for the Soviet government. The party consisted of 10 engineers and superintendents. The company, during the progress of the project, expects to have about 80 engineers and construction superintendents in charge of the work.

The party consisted of G. B. Nisbet, metallurgical chemist; T. L. Hughson, assistant dam construction engineer; W. S. Smith, geologist; J. K. Harris, civil engineering mining department; and C. E. Dale, W. J. Hallas, B. F. Parris, Clare F. Saltz and J. J. Kile, assistant superintendents.

Canadian Fabricator Buys Steel in England

MONTREAL, Aug. 19.—The Dominion Bridge Co., Lachine, Que., which has been awarded the contract for the large penstocks for the Powell River Co.'s new pulp and paper mill, has placed an order for 2500 tons of steel with English steel companies. Heretofore, steel penstocks for almost every paper mill in Canada have been made in Pittsburgh, and it is understood that this is the first order of the kind placed in Great Britain. The new British preferential tariff rates

R. A. OLSEN, who has been identified with the Tuthill Spring Co., Chicago, for the past 14 years, the last six as sales manager, has severed his connection with the company, effective Sept. 1. His plans for the future are not definite.

VICTOR W. PETERSON has been elected president and general manager of the Shafer Bearing Corporation, Chicago. He is also president of the Hannifin Mfg. Co. and the Sherman-Manson Mfg. Co.

S. R. ROBINSON formerly foundry manager, Industrial Brownhoist Corporation, Bay City, Mich., has been appointed metallurgical engineer for the Ohio Steel Foundry Co., with headquarters at Springfield, Ohio. The steel foundry of the Industrial Brownhoist Corporation was recently purchased by the Ohio Steel Foundry Company.

tend to turn business that formerly went exclusively to United States mills to the British producers.

Industrial Engineers Plan Convention in October

Society of Industrial Engineers will hold its seventeenth national convention at the Mayflower Hotel, Washington, on Oct. 15, 16 and 17. Among the round-table subjects to be discussed are "Coordinating Industrial America's Materials, Machines and Men," "Stabilizing Industrial America's Purchasing Power," "Present Status of Plant Maintenance," "Present Status of Time Study Engineering and Wage Incentives" and "Increasing Industrial America's Profits."

Harrington Emerson will be one of the speakers and will take as his subject, "What Is Ahead of Us as Industrial Engineers." The evening session on Oct. 16 will be known as Harrington Emerson night and will include the presentation of a memorial in the form of a bronze tablet mounted on a walnut easel, which will contain a three-quarter likeness of Mr. Emerson, a list of his 13 principles of efficiency and an outstanding quotation of his writings.

The memorial will be presented to the society by Mr. Emerson's present and former associates and will hereafter be awarded each year to that chapter which during the previous year has rendered the most meritorious service to the society and to industry.

OBITUARY

JAMES H. EDWARDS, chief engineer of the American Bridge Co., New York, died of heart disease in New York on Aug. 14, aged 66 years. He



James H. Edwards

was born in Oxford, N. Y., and was graduated from Cornell University in 1888. After graduation he entered the employ of the Berlin Iron Bridge Co., East Berlin, Conn., as a draftsman and held the position of chief engineer of the company for six years until 1900, when the Berlin company became a part of the American Bridge Co. He became assistant chief engineer of the company, later advancing to chief engineer. One of Mr. Edwards's chief interests was the development of the welding process in building construction. For 15 years

he was a trustee of Cornell University, representing the alumni of that institution.

IRA NELSON HOLLIS, formerly president of Worcester Polytechnic Institute, died at his home in Cambridge, Mass., on Aug. 15, aged 74 years. He was graduated from the United States Naval Academy in 1878. During the next 15 years he served in various positions connected with the design, inspection and operation of marine machinery and was chief engineer of two ships. In 1893 he left the Navy to become professor of engineering at Harvard University. In 1913 he became president of Worcester Polytechnic Institute, retiring in 1925. Dr. Hollis had filled many positions



Ira Nelson Hollis



James Carey Davis, advisory operating vice-president of the American Steel Foundries, whose death was noted in *The Iron Age* of last week

of importance in addition to his professional duties. He was president of the American Society of Mechanical Engineers in 1917.

ARTHUR S. HOLMES, president, Holmes Engineering Co., Oshkosh, Wis., died Aug. 10 at the age of 55 years. He was a native of Oshkosh. After spending several years in field work for the Challoner Co., Oshkosh, and Reed & Dueker, Memphis, Tenn., he became vice-president and sales manager of the Green Bay Drop Forge Co., resigning Jan. 1, 1929, to devote his entire time to the Holmes Engineering Co.

Cast Iron Pipe Output 1,734,654 Tons in 1929

WASHINGTON, Aug. 19.—Reflecting a decrease of 12.9 per cent in quantity and 16.5 per cent in value, the output of cast iron pipe and fittings in the United States in 1929, according to data collected up to date by the Bureau of the Census totaled 1,734,654 net tons, valued at \$76,046,989, against 1,991,155 tons, valued at \$91,042,892 in 1927. Data on pipe and fittings made as a secondary product in other industries for 1929 are incomplete. Production of gas and water pipe and fittings in 1929 amounted to 1,365,609 tons, valued at \$56,898,767, against 1,505,090 tons, valued at \$65,549,844, making a decrease in value of 13.2 per cent last year.

Bell and spigot pipe production in 1929 total 1,243,949 tons, valued at \$45,985,748, a decrease in value of 15.4 per cent when compared with the 1927 output of 1,388,338 tons, valued at \$54,338,352. A sharp increase of 24.8 per cent, however, was made in

the value of the production of flanged and culvert pipe last year, with a total of 41,098 tons, valued at \$2,259,677 against 31,736 tons, valued at \$1,810,278. Fittings showed a decline of 8 per cent in 1929, dropping to 80,562 tons, valued at \$8,653,342 from 85,016 tons, valued at \$9,401,214.

The production of soil and plumbers' pipe and fittings in 1929 was 369,045 tons, valued at \$19,148,222, a decrease of 25.5 per cent in value, under the 1927 production of 488,933 tons, valued at \$25,688,150. For the first time the bureau showed separately the production of pipe cast by the centrifugal process, which amounted to 334,670 tons, an amount which is included in the grand total.

Range Boiler Orders Up

WASHINGTON, Aug. 19.—Production of range boilers in July totaled 53,459 units, against 42,723 in June, while orders increased to 47,174 from 32,482, according to reports received by the Department of Commerce from 13 producers having a daily capacity of 9960 boilers.

Malleable Castings Orders Made Slight Gain in July

WASHINGTON, Aug. 19.—Orders for malleable castings in July totaled 34,731 tons, against 33,961 tons in June, according to reports received by the Department of Commerce from 117 firms operating 131 plants. Production was 31,099 tons, or 31.1 per cent of capacity, against 39,526 tons, or 40.2 per cent of capacity, while shipments were 32,422 net tons, compared with 43,966 tons.

In the first seven months of 1930, orders aggregated 358,471 tons, compared with 525,906 tons in the corresponding period of last year. Production was 385,345 tons, or 54.5 per cent of capacity, against 538,582 tons, or 80.4 per cent of capacity, and shipments were 380,976 tons, compared with 532,846 tons.

American Road Builders' Association will hold its twenty-eighth annual convention and road show at St. Louis from Jan. 10 to 16, 1931.

Fabricated Steel Bookings in July Gain 8000 Tons

WASHINGTON, Aug. 19.—Orders for fabricated structural steel in July were computed at 284,000 tons, or 71 per cent of the estimated capacity of 400,000 tons. Orders actually reported by firms with a capacity of 295,667 tons were 211,555 tons. The computed bookings in July reflected an increase of 8000 tons over those of 276,000 tons in June. Shipments in July were computed at 304,000 tons, or 76 per cent of capacity, against 300,000 tons, or 75 per cent of capacity, in July.

In the first seven months of the current year, computed bookings were 1,876,000 tons, or 67 per cent of capacity, against 2,263,800 tons, or 87 per cent of capacity, in the corresponding period of last year.

German Unemployed Total 11 Per Cent of Population

HAMBURG, GERMANY, Aug. 4.—The total of unemployed in Germany at the end of July was 2,500,000, which, with their families, are estimated to represent 11 per cent of the total population. Unless there is a considerable improvement in business, unemployment is expected to reach more than 4,000,000 this winter. The iron, steel, machinery and non-ferrous metal industries are employing about 138,000 less workers than in the same period of 1929, and the trend toward decreasing the personnel of shops continues, with the electrical and machinery industries reporting further dismissals.

Aircraft Industry Made Big Gain from 1927 to 1929

WASHINGTON, Aug. 19.—Making an increase of 192.9 per cent, aircraft and parts manufactured in 117 establishments in 1929 were valued at \$61,973,079, against \$21,161,853 in 1927, when the number of establishments was 70, according to the Bureau of the Census. The 1929 total was made up as follows: Airplanes, 5130, valued at \$38,724,987; seaplanes and am-

phibians, 176, valued at \$5,949,671; parachutes, 6188, valued at \$1,437,602; propellers, 14,184, valued at \$2,040,299; other complete craft, \$639,990; airplane parts, and engines made for sale as such, \$8,187,285; repair and experimental work, \$3,387,269; other products, \$1,605,976.

Republic Steel's Profits Low in Second Quarter

The Republic Steel Corporation, in its first quarterly statement since the combination of the steel plants forming the present corporation, reports net profit for the quarter ending June 30 amounting to \$1,171,465. Net gain from operations, after deducting charges for maintenance and repairs of plants, was \$3,146,271 and provision for Federal taxes, was \$3,065,449, from which was deducted \$1,893,984 for depreciation and renewal of plants and exhaustion of minerals. Interest on bonds was \$885,993, leaving \$285,472 available for dividends. Combination net profits of the several companies for the first quarter of the year prior to the consolidation were \$1,357,769.

Byers Operations Being Transferred to Ambridge

The A. M. Byers Co., Pittsburgh, is gradually eliminating the operation of its Ohio properties at Girard, Trumbull County, and transferring operations to Ambridge, Pa., where it has erected a new plant for the commercial production of mechanically puddled iron by the Aston process. Further suspensions at the Girard plant were announced this week.

For a number of years, this has been the largest property in the country devoted to the production of puddled iron by hand puddling, and included 88 puddling furnaces. In recent years the number of workmen has been reduced to 750, whereas at one time this property employed upward of 2500 workers. Somewhat more than a year ago, the Byers company dismantled its blast furnace at Girard. Workers at the Girard plant are being transferred to Ambridge.

Sheet Steel Sales in July Gained 10 Per Cent

A slight upturn in sales of sheet steel is shown in the July report of the National Association of Flat Rolled Steel Manufacturers, Cleveland. Sales by independent mills during the month amounted to 207,400 net tons, compared with 187,412 tons during June, or a gain of 10 per cent. However, production declined more than 20,000 tons, having been 186,206 tons, compared with 205,675 tons in June. Shipments also declined, amounting to 194,767 tons, against 212,930 tons during the previous month. Unfilled orders on Aug. 1 were approximately the same as on July 1. The July report and comparison in net tons follow:

Net Tons	July	June	May
Sales	207,400	187,412	204,589
Production	186,206	205,675	274,220
Shipments	194,767	212,930	266,436
Unfilled orders.....	432,298	431,324	461,756
Unshipped orders.....	119,974	116,601	119,117
Unsold stocks.....	82,708	83,988	85,585
Capacity per month.	546,500	517,200	553,800
Percentage reporting	67.6	67.6	67.6

Percentages, Based on Capacity	July	June	May
Sales	56.2	53.6	54.7
Production	50.4	58.8	73.3
Shipments	52.7	60.9	71.2
Unfilled orders.....	117.0	123.3	123.4
Unshipped orders.....	32.5	33.3	31.8
Unsold stocks.....	22.4	24.0	22.9

Steel Springs Production \$47,780,132 in 1929

WASHINGTON, Aug. 19.—The total value of shipments or deliveries of steel springs, exclusive of wire springs, in 1929, according to data collected up to date by the Bureau of the Census was \$47,780,132, an increase of 6.2 per cent when compared with \$44,977,132 reported for 1927. In each year the number of establishments reporting was 94. The value of springs made in the industry itself, devoted principally in the production of flat and hot-wound steel springs, was \$39,272,430 in 1929 and \$36,915,181 in 1927.

Of the 1929 production, 319,548 net tons, valued at \$35,904,526, consisted of leaf springs for railroad equipment, motor vehicles, carriages, wagons, etc., while 69,254 tons, valued at \$6,082,369, consisted of hot-wound springs for railroads.

THE new centrifugal cast iron pipe plant of the Warren Foundry & Pipe Co., at Everett, Mass., is nearing completion and will be ready for production of pipe by the sand spun process sometime in September. Brick work on the buildings is being completed and equipment installed.

The steel structure shown at the right of the plant buildings is a crane runway paralleling a railroad siding. The photograph of the Warren plant was taken from the property of the Mystic Iron Works, only a few hundred feet distant, which will be the chief source of pig iron supply for the new pipe plant.



W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

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Wage Readjustments

WE are in for wage reductions. How sweeping they will be is another story. The doctrine of the consuming power of high wages is losing ground. There is too much rehiring at reduced rates, following recent shutdowns, to prevent a spread of the wage revising practice. What has occurred is largely outside the metal-working fields, but the prolongation of the depression provides the sentiment that fosters all sorts of cost cutting.

Maladjustments were overlooked as long as demand continued strong. And it is maladjustment that is at the root of the wage question. Industrial activities notorious for their high labor costs prospered along with those of low labor costs. The fact that the relatively few at high wages enjoyed disproportionately the fruits of all labor was lost in the general acceptance of the *miraculum* of the bulging pay envelope.

A letter from a reader on another page draws attention to some of the points at issue. It holds that the depths of depression cover a temporary period of bottom prices and that to try to adjust wages to current prices fails to recognize the better conditions to follow. There is the tacit argument that wages will not respond promptly or in unison with prices and that buying power is thereby crippled. Sliding scales according to cost of living indices are not practicable; at least there is no machinery to provide wage rates with the flexibility of prices. To base wages on cost of living factors is regarded in many quarters as a doubtful way out. The belief is that in the long run wages will be governed by the play of broad economic forces. Because wages have been maintained with noteworthy steadiness in the face of a long, downward trend in prices is considered a phenomenon that does not destroy the truth of the belief.

A cause, and not an unimportant one, for the lethargy in building construction is the labor cost. More or less responsible contractors now are operating with union labor at lower than the published scales chiefly in regions where the unions are not dominant, and the well established contractors, living up to their agreements, believe they face lean times, at least for themselves, until the building trades conclude that wages must be definitely lowered. Meanwhile with building and general construction dull, a broad, sustained industrial revival seems unlikely, so that conditions are ripe for a fairly comprehensive wage revision.

In the months after the war and in the depression of 1921 following the epidemic of "cancelitis," there were demands for sharp chopping of wartime wages. It was all forestalled by resumption of building work to satisfy the great housing shortage. Today there

are no particular shortages and even the forced draft of speeded-up government work has been insufficient to render industry careless of the wage factor. It looks very much as though the economic forces will now be directed on the wage question, and if so, they will work injustice to many individuals and, as some economists have warned, hobble any quick rebound in industrial activity.

The Recent Trend in Trade

BY April 1 suspicions arose in some quarters that something fresh had gone wrong with business and in May this feeling was widespread. The later view still is that original influences were simply working out farther. The confusion arises from the complications of two forces arising at different times, the beginning of trade recession at the middle of last year and the stock market collapse four months later. The first has a longer range influence than the second, which had spent a large part of its force by the beginning of this year.

The first was a relatively slow movement and therefore not particularly impressive. For various obvious reasons the second was very impressive. Early this year there was too much disposition to refer or relate all trade movements to the stock market's performance. When in the early weeks of this year trade was expanding quite sharply, but from a relatively low level, there was too much disposition to conclude that we were getting out of the worst of our troubles. When hopes were disappointed it was natural enough to suggest that something new had gone wrong, but there was merely a continuance of the old recession, that had begun, from a high level, four months before the stock market began to collapse.

The fact should be squarely faced that trade has been growing progressively worse this year. It may have gone down so far that it must perforce have a rebound, but it should be recognized that so far there is no such movement visible. What has occurred to date should be understood as well as information available permits.

In this department of THE IRON AGE of May 29, under the caption "Car loadings show no trade gain," it was shown that freight car loadings in the second nine weeks of the year totaled 3.6 per cent more than in the first nine weeks, whereas ordinarily the increase is greater. There was approximately one per cent loss from the usual gain. Since that time the divergence has grown greater. The more recent

period makes a poor showing relative to the early weeks in the year.

There is little disposition to deny the accuracy of freight car loadings as an index to trade activity, but as a check we have consulted statistics representing two important forms of containers, boxboard shipments and steel barrel shipments. Both industries have been growing rapidly, hence growth in previous years must be considered. From first to second quarter this year boxboard shipments increased 3.3 per cent, but in 1927 the increase was 6.5 per cent and in 1928 7.5 per cent. In 1929 there was only 0.6 per cent increase, and that year may be considered exceptional. The first quarter shipments had been remarkably large, 15 per cent over the first quarter of 1928.

In steel barrel shipments we have the following first to second quarter gains: 1927, 12 per cent; 1928, 27 per cent; 1929, 28.7 per cent. This year there was a decrease of a small decimal of one per cent. The half-year gained one per cent over the first half of last year, but preceding years had shown large gains.

July statistics are quite incomplete at the present time, but such as are available show July in unusually poor relationship to the first half average. That is notably the case with both freight car loadings and with steel production.

There is some comfort in the showing. It is better to get to a low and rebound point than to stagnate. The stock market collapse is to be dismissed as anything like a major influence. We are in an industrial decline that began at the middle of last year and the longer it lasts the more chance there is that the turning point has been reached.

Steel Tonnage of the Future

HOW will steel tonnage grow in the years to come? After steel had practically supplanted wrought iron up to just before the war, production increased in manner equal to a doubling in about seven years. In the five years through 1928 it increased at a rate equal to a doubling in 24 years. Last year was exceptionally good and this year is exceptionally poor, so that neither of these years counts.

Of course when an industry reaches a sort of maturity it cannot grow at anything like the rate in its adolescent stage. All geometric rates of progression are impossible in the long run, including the familiar one of one cent for the first nail, two for the second, four for the third, and so on. Those who look forward intelligently do not pay much attention to total steel tonnages of the past. They endeavor to appraise the various lines of consumption separately, also to consider relatively new lines that may have great growth.

Steel producers may perhaps be divided into three classes, those optimistic by nature who feel there are almost unlimited possibilities, those who seriously doubt whether even the present slack can be taken up, and those who do not care at all except to try to make sure to be in at the finish. We are indisposed to hold a brief for any of the classes but can point out some considerations.

Having referred to the slower growth an industry apparently mature is likely to have, we mention that

the growth of alloy steel, really only a small tonnage item so far, will tend to restrict total tonnage by there being furnished steel which will perform more service without increase in weight.

It is argued in some quarters that perhaps the steel industry had much help from the growth of the automobile industry and the structural fabricating industry, but cannot count on much further growth there. That, however, is open to question. Readily granting that the number of passenger automobiles produced is not going to increase as it did in the past, there is a strong chance of the average weight per car increasing over the showing of last year and this.

From 1923 to 1928 there was a large increase in average weight per car. That was a matter of common observation, and there is a more definite measure, in automobile steel consumption reported annually by THE IRON AGE compared with the total number of cars and trucks produced. With super-highways, with automobiles used more for comfortable transportation and less for sport and with lower prices for heavy cars we may find heavy cars in much wider favor a few years hence than at present. Also there are heavy trucks to be considered.

As to the future of fabricated structural steel there is a bald fact. Ignoring this year and last and comparing 1923 and 1928, which were simply years approximately equal in goodness, there was an increase in fabricated structural steel lettings equal to a doubling in 12 years, whereas during the same period total steel increased at only half the rate, or at the equivalent of a doubling in 24 years. Some extremely large buildings have lately attracted attention. Either they are going to be found freaks or there will be many of them. There are great possibilities in the double decking of streets and in additional subway work.

The steel railroad tie did not "take," much to the surprise of some. Perhaps eventually the steel highway will. There is one steel manufacture that has increased this year over last—steel barrels, with 5 per cent increase. Then there are the big containers, for less-than-carload shipments, to go by truck to and from the freight car. Not the least important factor is the growing evidence that steel makers are thinking more and more of campaigning for new and extended uses of steel. THE IRON AGE has repeatedly urged a change in attitude from striving chiefly to produce well what is demanded to one that also considers seeking applications that buyers had never visioned.

American Steel in Canada

FROM much that has been printed on the effect of the recent protection victory on Canada's fiscal policies, one might conclude that trade currents in the Dominion will show important changes in the coming year. The outgoing ministry had lately set up some new duties against imports from the United States as a response to the Hawley-Smoot tariff, and the victorious Conservatives announced that they intended to do more in the same direction. Naturally iron and steel products figure in no small way in the program of the new administration. Mr. Bennett, the new prime minister, doubtless had them in mind when in the campaign he declared against "any policy which sends abroad good Canadian money to pay for articles

that can be economically and usefully produced by the labor of our own people."

Positive as such campaign promises sound, and sincere as may be the intentions of those who make them, there should be no haste in expecting a marked change of the channels in which Canada's iron and steel trade has been moving. Dominion policy in respect to iron and steel tariffs has had many ups and downs in the past quarter century. Beginning in the early nineteen-hundreds with bounties on pig iron and steel, in so far as they went back to native ores, the Dominion Government built up a system of duties intended to protect domestic blast furnaces and steel works and at the same time to give preference to producers in Great Britain.

Progress has been made, as a result, in establishing iron and steel manufacture across the border; but the vicissitudes have been many and the financial successes few. Apart from the Sydney, Nova Scotia, enterprise, American ore and fuel have been the chief dependence. In time the bounties went by the board. Also, from time to time the agrarian population decided that its steel was too expensive, and duties came down. Only two years ago, the head of one of the largest steel companies in Ontario, in arguing for higher duties, complained that American steel companies were able to sell their products in Canada "at prices below production costs in this country."

Simultaneously with this slow and painful development in Canada, steel manufacture in the United States has expanded marvelously. With agriculture so preponderant and with vast stretches of sparsely populated territory, the Canadian industry could not afford to build mills covering anything like the full range of products. Rails and bars were the chief dependence. Meanwhile in the United States, in response to a home demand that in recent years has grown to be more than 40 times the output of all the Canadian mills, our steel makers have invested scores of millions in new plant. Improvement in quality of product has been no less marked than has the development of new forms of rolled steel and of new adaptations of old forms—a diversification and adaptation movement that has had no parallel in this country or in Europe.

It is not surprising, therefore, that Canadian users of steel have found it advantageous to buy so largely from the mills of the United States. On no small part of what they buy on this side their home mills could not bid. Even with preferential tariffs British makers are handicapped by distance, by the damage to product in overseas shipment (in contrast with speedy delivery of steel in the condition in which it left the mill), by the difficulty of claims adjustments, by the impossibility of hand-to-mouth buying, and by other factors with which Canadian buyers have long been familiar.

With all the years of government encouragement, the Canadian steel industry has come up to less than a 50 per cent occupation of its home market. In recent years American mills have supplied half and at times more than half the Canadian demand, while small percentages have gone to Great Britain, Belgium and France. For a number of years Canada has taken 40 per cent of our iron and steel exports. Both 1928 and 1929 showed a tonnage gain—from 834,025 gross tons in 1927 to 1,181,010 tons in 1928 and 1,230,378 tons

in 1929. In the same three years Canadian steel works produced respectively 915,607, 1,239,303 and 1,380,000 tons of ingots and castings—figures which must be reduced 25 to 30 per cent to arrive at finished steel totals.

Countervailing duties and British preferentials notwithstanding, we do not look for any appreciable reduction in the percentage of Canadian steel consumption that is supplied by American mills, though the existing depression may affect totals for a time. Generally speaking, Canada and the United States will do more business with each other year by year. Speaking of steel, Canadian users have found increasing reasons—on the score of prices, freights, quality, service and adaptation to use—for buying from the mills of the United States. Those reasons will continue to be chiefly determining, even in the face of political shifts and temporary changes in fiscal policy.

CORRESPONDENCE

Hardness Conversion Tables

To the Editor: We have compared the hardness conversion tables found in the July 10, 1930, issue of *THE IRON AGE* with a conversion table used as standard in this plant and find that it does not compare as favorably as some other tables which we have checked against ours.

The hardness conversion table in common use here is one given by R. R. Moore, metallurgist of the Wright Aeronautical Corporation, in his paper published in the December, 1927, issue of the *Transactions of the American Society for Steel Treating*. This table conforms closely to figures obtained in tests here and was also found to agree very closely with figures given by S. N. Petrenko in his paper, "Relationships Between Rockwell and Brinell Numbers," which is to be found in the July, 1930, issue of the *Bureau of Standards Journal of Research*.

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Believes Wage Reductions Now Unwise

To the Editor: I have read with interest the review of current price movements by Dr. Lewis H. Haney on page 433 of *THE IRON AGE* of Aug. 14. It is my belief that while Dr. Haney is sound in his statistical data, there may be a question as to the soundness of some of the deductions that he draws from them.

The majority of financiers, business men and industrialists do not believe that the present conditions are normal by any means. They believe that American business is now scraping the very bottom of a marked depression of the U type. Most of them look for a decided upward trend in the near future.

If the present situation is a temporary one from which a substantial recovery is expected, it would be poor business management to base important future policies upon it. It would be particularly unfortunate if such policies were adopted that would indicate lack of faith in the expected recovery.

Dr. Haney states that "as prices come down and dividends are passed, the price of labor must come down." This might be true if present conditions or worse were expected as a future normal. If we consider present conditions to be abnormal, however, wage reductions at this time are decidedly not good business. Instead of causing the hoped for upward turn in commodity prices, such a policy would inevitably insure a continuance of the down-

The Week in Business

Drift of Current Financial
and Economic Opinion

ONCE again in financial and economic circles the picture of the outlook is that of the darkness before the dawn. The drought, meanwhile, which was appearing as a factor a week ago, is passing from the scene. The view is rather general that the losses of the corn crop will be met in part by the larger production promised for other crops, but that the drought, none the less, will prove a retarding influence on the business revival.

Increased merchandise and miscellaneous freight loadings are accepted in a number of quarters as giving evidence of a definite check to the downward movement.

"Recovery from trade depression," says the *New York Times*, "will begin at about the time when markets have given up hope of its arrival. . . . Possibly the new forward movement will have its real beginning at about the time

when the community has concluded that America has lost even the basic elements in prosperity which it enjoyed four years ago."

Production Under Consumption

As a positive factor for betterment there is a reiteration of beliefs that production in many manufacturing industries has been below consumption in recent months, and now comes the reminder that increased retail trade in the fall months will call for increased production.

Deferred requirements will bring heavy buying, according to Theodore H. Price, in *Commerce and Finance*, "as soon as commodity prices are stabilized and hold steady to firm for a convincing period," and he suggests that the decline in commodity prices has been checked.

The Harvard Economic Society, while still noting large visible

stocks of commodities, says they "need not prevent broadening of the price advance."

Building Permits Increase

As regards building work, while the volume of building contracts for July was negative, the findings of S. W. Straus & Co. with respect to building permits are that July showed a gain of 1.6 per cent over June. The Harvard service repeats its belief that "with bonds and money markets as favorable as they are, it seems probable that construction in the months ahead will attain more satisfactory volume."

The most optimistic statement of the week is that of the *Business Week*, which says: "There is reason to believe the worst is over—that recovery has begun; it will be rapid as compared with recovery in 1921."

ward trend. Wages now constitute more than 55 per cent of our total purchasing power. If we curtail wage rates at a time when short hours and unemployment are both weakening purchasing power, buying will shrink still further.

To encourage the establishment of wage levels based on the bottom of a depression low would be as poor an example of business judgment as to base fixed dividend rates on the very peak of an exceptional boom, and much more harmful. It would be an admission that recovery was not to be expected.

In a situation such as the present, which is largely psychological, the general price level of commodities has very little to do with demand. People will not buy when they are uncertain as to the future, even when prices are falling. On the other hand rising prices do not seem to curtail buying when the general opinion is optimistic.

I believe that Dr. Haney is also wrong in his assumption that steel buying is curtailed because the general price of that material is 8 per cent above the general commodity level. The steel makers are wise enough to know that in an abnormal condition such as this, such price spreads make little difference. They have the automotive industry to look upon as a shining example of this. Automobile prices are some twenty per cent below the general commodity level, yet the current demand for motor cars is by no means overwhelming.

JOHN W. WILLIAMS.

What the Future Industrial Leaders Are Taught

(Concluded from page 497)

other men who desire to prepare for executive responsibilities.

"At intervals conferences have been held at the Institute at which selected representatives of the divisions of the Corporation have, in collaboration with the members of the Institute staff, organized the

outlines and text material used in these courses. This material is designed to be used in the conference method of training, with groups of men at the plants, and training conferences are held at the Institute to train men from the divisions to act as conference leaders of these groups in their own plants. The text material is used also in corresponding courses conducted at the Institute. Over 4000 men, representing 26 divisions, have been in training in the program over the past year."

The course in metallurgy of iron and steel covers also heat treating. The course uses Sauveur and Boylston's "Metallography and Heat Treatment of Iron and Steel." Considerable microscopic work is done in the laboratory.

Use of Fuel Oil in Steel Making

(Concluded from page 487)

the operation, but it is certainly desirable that the work should be divided, as nearly as possible, between the two ends of the furnace. When the time factor depends entirely upon the human element it requires careful supervision to avoid considerable irregularity in operation. On the other hand, variations, melt to melt, will prevent automatic timing of reversals, except during certain stages of the heat. One cannot over-emphasize the necessity of watching the reversals carefully, so that a complete balance is maintained between both ends of the furnace. The checkers are the furnace's heat storage or flywheel; by careful manipulation of this heat storage the melter can make most of the grades "in high gear"; furthermore, the hills and valleys in the rate of fuel consumption will be leveled out.

Iron and Steel Markets

Signs of Improvement Appearing

Steel Orders and Operations Slightly Up—Rail Bookings,
Pipe Line Business and Other Projects Counted
On to Aid Business Next Month

A TURNING point in steel business is not yet definitely in sight, but there are scattered indications of more liberal buying in September and a moderate improvement this week in orders and operations.

Steel ingot output is at 53 per cent, compared with 52 per cent a week ago, but rolling schedules in some districts, particularly of sheet mills, have gained more than raw steel production.

At Chicago, sales of finished steel expanded 30 per cent and contract specifications 20 per cent over those of the preceding week, when business was checked by anxiety over the crop situation.

In the development stage but counted on to bring larger steel tonnage next month are rail bookings, new pipe line business, oil tank construction, the well-sustained volume of inquiry for structural steel for buildings and bridges and the country-wide highway program backed by Federal aid.

In pipe lines, a new project is a 260-mile gas line to be run from the Kentucky fields to points in the Ohio River valley by a subsidiary of the Central Public Service Corporation. The oil industry also promises an increasing amount of tank construction, for which inquiries, some of sizable tonnage, are expected soon to appear.

A few farm machinery builders are stepping up production, as is evidenced by heavier specifications for steel, though the improvement is due more largely to export orders than to prospects for domestic business. The canning companies, it appears, will not be hard hit by the drought, although some packs of vegetable crops will be curtailed. Tin plate makers are not seriously affected, the leading producer continuing operations at 70 per cent of capacity. Increased radio output is taking a little more steel.

Whatever gains occur in steel buying in the immediate future probably will not be aided materially by the automobile industry. The leading maker of low-priced cars is expected to reduce its operations from a four-day to a three-day a week basis, while another large manufacturer is slowing down production preparatory to the introduction of new models in October. Only two or three companies in the medium-price field are maintaining good schedules.

Steel companies that are dependent to a large extent on automobile business have experienced no marked improvement in orders from that source. At Cleveland, in fact, steel plant operations have declined 5 or 6 points in the week, whereas in other districts

the rate of production has held its own or has gained slightly.

Building steel bookings of the week call for 40,000 tons of structural shapes, while further additions to a large pending list of new projects totaled 37,000 tons. The New York district has accounted for the bulk of recent awards, but large projects are originating elsewhere, as for example, a bridge at Evansville, Ind., requiring 8000 tons, and subway work in Philadelphia, amounting to 6000 tons. At Pittsburgh, two large bridges, an extensive railroad station project and a new post office are early prospects.

The second advance in as many weeks of 25c. a ton in the average price of heavy melting steel scrap at Pittsburgh was brought about by substantial buying. A firmer tendency in the Chicago market was owing to a moderate purchase. In both instances the scarcity of good grades was a factor. Marked strength also has developed at St. Louis.

Pig iron shipments at Chicago have gained 35 per cent over those of the corresponding period in July, while a Cleveland producer estimates a gain of 33 per cent, an evidence of sharp depletion of inventories rather than a reflection of increased melt. However, some consumers are using iron more freely, radiator and sanitary ware manufacturers, for example.

Other indexes pointing to at least a moderate degree of improvement are a 10 per cent gain in sheet steel sales in July, reported by the independent makers; an increase of 8000 tons in the computed bookings of fabricated structural steel in that month over June; one of 2¼ per cent in orders for malleable castings, while range boilers, used largely for residences, registered a gain in orders last month of 45 per cent. On the other hand, the index of the National Machine Tool Builders' Association for July dropped to the lowest point since March, 1925, following the depression of 1924.

The development in steel prices amounts to an extension of the lower levels to a wider circle of buyers. An outright reduction of \$1 a ton has been made on steel bars at Cleveland, while at Chicago 1.75c. a lb. now applies on the general run of orders for plates, shapes and bars, and at Birmingham prices on these products have declined \$1, in line with the basis of other districts. Galvanized sheets are off \$1 a ton at Chicago, and continue irregular elsewhere. On black sheets, 2.40c., Pittsburgh basis, has been quoted in the Detroit and Cleveland districts.

THE IRON AGE composite prices are unchanged, that for finished steel being 2.156c. a lb. and that for pig iron \$16.88 a gross ton.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Aug. 19, 1930	Aug. 12, 1930	July 22, 1930	Aug. 20, 1929
No. 2 fdy., Philadelphia.....	\$19.76	\$19.76	\$19.76	\$21.26
No. 2, Valley furnace.....	18.00	18.00	18.00	18.50
No. 2 Southern, Cin'ti.....	15.69	15.69	16.19	17.69
No. 2, Birmingham.....	14.00	14.00	14.00	14.50
No. 2 foundry, Chicago*.....	17.50	17.50	18.00	20.00
Basic, del'd eastern Pa.	18.75	18.75	18.75	19.75
Basic, Valley furnace.....	18.00	18.00	18.00	18.50
Valley Bessemer, del'd P'gh..	20.26	20.26	20.26	20.76
Malleable, Chicago*.....	17.50	17.50	18.00	20.00
Malleable, Valley.....	18.50	18.50	18.50	19.00
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace....	94.00	94.00	94.00	105.00

Rails, Billets, etc., Per Gross Ton:	Aug. 19, 1930	Aug. 12, 1930	July 22, 1930	Aug. 20, 1929
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh..	31.00	31.00	31.00	35.00
Sheet bars, Pittsburgh.....	31.00	31.00	31.00	35.00
Slabs, Pittsburgh.....	31.00	31.00	31.00	35.00
Forging billets, Pittsburgh...	36.00	36.00	36.00	40.00
Wire rods, Pittsburgh.....	36.00	36.00	36.00	42.00

Skelp., grvd. steel, P'gh, lb. ..	Cents	Cents	Cents	Cents
	1.70	1.70	1.70	1.85

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.65	1.65	1.65	1.95
Bars, Chicago.....	1.75	1.75	1.75	2.05
Bars, Cleveland.....	1.70	1.75	1.75	1.95
Bars, New York.....	1.98	1.98	1.98	2.29
Tank plates, Pittsburgh.....	1.60	1.60	1.65	1.95
Tank plates, Chicago.....	1.75	1.75	1.75	2.05
Tank plates, New York.....	1.88	1.88	1.93	2.22½
Structural shapes, Pittsburgh	1.60	1.60	1.65	1.95
Structural shapes, Chicago...	1.75	1.75	1.75	2.05
Structural shapes, New York	1.85½	1.85½	1.90½	2.19½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh..	1.65	1.65	1.65	1.90
Cold-rolled strips, Pittsburgh	2.35	2.35	2.45	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel, Per Lb. to Large Buyers:	Aug. 19, 1930	Aug. 12, 1930	July 22, 1930	Aug. 20, 1929
Sheets, black, No. 24, P'gh...	2.45	2.45	2.45	2.85
Sheets, black, No. 24, Chicago	2.55	2.55	2.65	2.95
dist. mill.....	3.05	3.05	3.10	3.50
Sheets, galv., No. 24, P'gh...	3.15	3.20	3.25	3.60
Sheets, galv., No. 24, Chicago	2.05	2.05	2.15	2.35
dist. mill.....	2.25	2.25	2.25	2.45
Wire nails, Pittsburgh.....	2.05	2.05	2.05	2.55
Wire nails, Chicago dist. mill	2.10	2.10	2.10	2.60
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.40
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.45
Barbed wire, galv., Pittsburgh	2.80	2.80	2.80	3.20
Barbed wire, galv., Chicago	2.85	2.85	2.85	3.30
dist. mill.....	5.25	5.25	5.25	5.35
Tin plate, 100-lb. box, P'gh..				

Old Material, Per Gross Ton:	Aug. 19, 1930	Aug. 12, 1930	July 22, 1930	Aug. 20, 1929
Heavy melting steel, P'gh..	\$15.25	\$15.00	\$14.75	\$19.00
Heavy melting steel, Phila...	12.50	12.50	12.50	16.50
Heavy melting steel, Chicago	12.00	12.00	12.00	15.25
Carwheels, Chicago.....	13.50	13.50	13.50	14.00
Carwheels, Philadelphia.....	14.50	14.50	14.50	16.50
No. 1 cast, Pittsburgh.....	13.50	13.50	13.50	16.50
No. 1 cast, Philadelphia.....	13.00	13.00	13.00	16.50
No. 1 cast, Ch'go (net ton)...	12.00	12.00	12.00	14.50
No. 1 RR. wrot., Phila.	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	10.00	10.00	10.00	14.00

Coke, Connellsville, Per Net Ton at Oven:	Aug. 19, 1930	Aug. 12, 1930	July 22, 1930	Aug. 20, 1929
Furnace coke, prompt.....	\$2.60	\$2.60	\$2.50	\$2.75
Foundry coke, prompt.....	3.50	3.50	3.50	3.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	11.12½	11.12½	11.12½	18.12½
Electrolytic copper, refinery..	10.75	10.75	10.75	17.75
Tin (Straits), New York.....	30.20	30.00	29.62½	46.50
Zinc, East St. Louis.....	4.40	4.32½	4.40	6.80
Zinc, New York.....	4.75	4.67½	4.75	7.15
Lead, St. Louis.....	5.35	5.35	5.15	6.55
Lead, New York.....	5.50	5.50	5.25	6.75
Antimony (Asiatic), N. Y. ..	7.75	7.75	6.87½	9.00

PITTSBURGH Scattered Indications of September Improvement—Scrap Stronger

PITTSBURGH, Aug. 19.—Scattered indications of probable September improvement in the steel industry are discernible in the Pittsburgh district this week. Belief that the effects of the nation-wide drought have been over-estimated is gaining ground and rains in some sections have improved conditions considerably. It is also pointed out that far-reaching ill-effects to the agricultural industry which might be expected to develop with crop failures and other results of dry weather will be felt by the steel industry for some time to come but will hardly be sufficiently pronounced in the next few months to interfere seriously with a mild seasonal improvement in business this fall.

One of the most encouraging factors at present is the improved outlook for the building industry. Increase in home building operation during July is being maintained this month, and Federal and State building programs are still going forward. Announcement of the Government road building program for the next fiscal year is encouraging, and in the immediate Pittsburgh district two large bridges, an extensive railroad station project and a new post office are expected to get under way before the end of the year.

The rail-buying season which will soon be under way will undoubtedly

improve market sentiment, and pipe makers believe that considerable line pipe tonnage will be placed in the next two months. At present seamless, lap-weld and electric-weld pipe units are running at close to capacity, notably on large sized material, and one maker of oil well casing reports heavier shipments to the mid-continent fields.

The automobile industry offers mixed trends, but a report that the leading maker is soon to reduce its production schedule from a four to a three-day week basis is far from encouraging. The other large maker of low-priced cars is slowing down pro-

duction preparatory to the introduction of model changes in October, and only two or three of the principal makers of medium-priced automobiles are maintaining good schedules.

Steel ingot operations in the Pittsburgh and nearby districts are unchanged at 50 to 55 per cent of capacity, while the smaller independents average about 45 per cent. Sheet production has been boosted slightly in the last week, but output of strip steel and bars has not been advanced materially. Tin mills are maintained at recent levels and leading makers have not been seriously affected by reports of crop failures in canning vegetables.

Prices lack strength but light buying has prevented adequate market tests on most products. Weakness is most pronounced in sheets, plates and shapes. A second advance in scrap prices in as many weeks has featured the market on primary materials.

Pig Iron.—The Davison Coke & Iron Co. last week banked its Neville

Island furnace, leaving only one strictly merchant stack in blast in the Pittsburgh-Valleys district. However, one of the Hubbard stacks of the Youngstown Sheet & Tube Co. is utilized principally for merchant production and the Adrian, Pa., furnace is a factor in the Pittsburgh market. Several steel companies also have surplus stocks of iron for sale and are the principal sources of supply for smaller steel producers who do not have blast furnaces. The pig iron market is very dull with sales confined principally to carload lots for immediate shipment. The volume of business thus far in August is about equal to the corresponding July period and consumers are showing no more interest in their future requirements. Since the first of the month radiator and sanitary ware foundries in the district have increased their operations slightly and are taking additional iron. Prices are being given very little test and on "spot orders" seem to be holding at \$18, Valley, for foundry iron and \$18.50 for malleable and Bessemer. The basic market is nominally quoted at \$18, with quotations of the Neville furnace 50c. higher on all grades.

Prices per gross ton, f.o.b. Valley furnace:

Basic	\$18.00
Bessemer	18.50
Gray forge	17.50
No. 2 foundry	18.00
No. 3 foundry	17.50
Malleable	18.50
Low phos., copper free	\$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	\$18.50
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

Semi-Finished Steel.—Shipments continue to average below the July rate and new business is negligible. Prices on billets, slabs and sheet bars are still nominally quoted at \$31 a ton, Pittsburgh, and spot sales of forging billets are being made at \$36, Pittsburgh. Specifications for wire rods have been slightly heavier in the last week. The price is unchanged at \$36, Pittsburgh.

Bars, Plates and Shapes.—Structural steel fabricators in this dis-

Outlook improved for building work and government building and road construction.

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Tin mills appear not to be seriously affected by reduced canning because of the drought.

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Heavy melting steel has advanced 25c. a ton for the second week.

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Bookings of considerable pipe line tonnage are expected in the next two months.

* * *

Light buying leaves no adequate test of the strength of steel prices.

trict are somewhat more hopeful than they were a few weeks ago. New inquiry is heavier. A number of large projects in the Pittsburgh vicinity seem closer to development than they were, and there is a prospect of improved business in the fall. A freight house for the Baltimore & Ohio Railroad in Pittsburgh, requiring 300 tons, was placed in the last week, but otherwise awards have been principally in small tonnages. Fabricated prices are very low, in some cases way too close to costs to enable bidders to get protection by lower mill prices. The plate market is even more stagnant as shipments to railroad car builders decline. A fair tonnage of plates is going into tanks and other oil country equipment. Shipments of reinforcing bars are keeping up, but new bookings are in light volume. Soft steel bars are very dull, and increased releases on alloy steel bars from a few automobile makers have stimulated business only slightly. The 1.65c.; Pittsburgh, price on bars is holding in this district, but plates and shapes are quotable at 1.60c. to 1.65c. with even the lower figure only nominal when large and desirable tonnages are in the offing.

Tubular Goods.—The pipe market

has been comparatively quiet in the last week, with no new developments reported in the large line pipe projects under consideration. The usual difficulties with right-of-way are being met with some lines, while financing is quite often a deterring factor. Pipe makers point out that some projects are kept very quiet up to the time the pipe is bought because of possible complications which might arise if the buyers' plans were known. For this reason pending projects which have received the most publicity recently may not be the next to be placed, even though several of these lines are very active.

Makers of line pipe in the larger diameters still have room on their books for considerable tonnage for this year's rolling and smaller seamless capacity, utilized principally for gasoline-carrying lines this year, is not entirely booked up. Lapweld and the larger seamless mills in this and the Youngstown district are running at practical capacity, with butt weld mills at about 50 per cent. One maker reports slightly heavier releases on butt weld material in the last few weeks, while another has booked a larger tonnage of seamless pipe for oil country use so far this month than in July. Boiler tubes are also more active, but mechanical tubing shows little improvement.

Wire Products.—Improved releases from automobile companies have boosted specifications for manufacturers' wire with some producers, but business as a whole shows no material gain. Merchant products are quieter than usual, as the jobbing trade in the Middle West is awaiting reports on the effects of the drought and assuming a more conservative attitude than usual. A bad year for the farmers usually means heavier demand for barbed wire at the expense of fencing, but it is too early to notice this tendency. Nail prices show no change, with \$2.05 the ruling price to jobbers. In a few instances, small buyers have been able to get \$2.10, as opposed to a usual price of \$2.15. Manufacturers' wire is holding at 2.30c., Pittsburgh.

Sheets.—Demand for sheet steel products has shown no general im-

THE IRON AGE Composite Prices

Finished Steel

Aug. 19, 1930, 2.156c. a Lb.

One week ago	2.156c.
One month ago	2.171c.
One year ago	2.398c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1930	2.362c., Jan. 7:	2.156c., Aug. 12
1929	2.412c., April 2:	2.362c., Oct. 29
1928	2.391c., Dec. 11:	2.314c., Jan. 3
1927	2.453c., Jan. 4:	2.293c., Oct. 25
1926	2.453c., Jan. 5:	2.403c., May 18
1925	2.560c., Jan. 6:	2.396c., Aug. 18

Pig Iron

Aug. 19, 1930, \$16.88 a Gross Ton

One week ago	\$16.88
One month ago	17.09
One year ago	18.42

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1930	\$18.21, Jan. 7:	\$16.88, Aug. 12
1929	18.71, May 14:	18.21, Dec. 17
1928	18.59, Nov. 27:	17.04, July 24
1927	19.71, Jan. 4:	17.54, Nov. 1
1926	21.54, Jan. 5:	19.46, July 13
1925	22.50, Jan. 13:	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.65c. to 1.70c.
F.o.b. Chicago.....	1.75c.
Del'd Philadelphia.....	1.94c.
Del'd New York.....	1.98c.
F.o.b. Cleveland.....	1.65c. to 1.70c.
F.o.b. Lackawanna.....	1.75c. to 1.85c.
F.o.b. Birmingham.....	1.85c. to 1.90c.
C.i.f. Pacific ports.....	2.25c.
F.o.b. San Francisco mills.....	2.25c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.....	1.70c. to 1.75c.
F.o.b. Birmingham, mill lengths.....	1.85c. to 1.90c.

Rail Steel

F.o.b. mills, east of Chicago dist.....	1.65c.
F.o.b. Chicago Heights mill.....	1.65c.
Del'd Philadelphia.....	1.84c. to 1.89c.

Iron

Common iron, f.o.b. Chicago.....	1.75c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.09c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c. to 1.65c.
F.o.b. Chicago.....	1.75c.
F.o.b. Birmingham.....	1.85c. to 1.90c.
Del'd Cleveland.....	1.78½c. to 1.83½c.
Del'd Philadelphia.....	1.80½c. to 1.85½c.
F.o.b. Coatesville.....	1.70c. to 1.75c.
F.o.b. Sparrows Point.....	1.75c.
F.o.b. Lackawanna.....	1.75c.
Del'd New York.....	1.85c. to 1.93c.
C.i.f. Pacific ports.....	2.15c. to 2.25c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c. to 1.65c.
F.o.b. Chicago.....	1.75c.
F.o.b. Birmingham.....	1.85c. to 1.90c.
F.o.b. Lackawanna.....	1.75c. to 1.80c.
F.o.b. Bethlehem.....	1.75c. to 1.80c.
Del'd Cleveland.....	1.78½c. to 1.83½c.
Del'd Philadelphia.....	1.66c. to 1.76c.
Del'd New York.....	1.85½c. to 1.90½c.
C.i.f. Pacific ports.....	2.15c. to 2.25c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
8 in. and narrower, P'gh.....	1.70c. to 1.75c.
Wider than 6 in., P'gh.....	1.65c.
6 in. and narrower, Chicago.....	1.85c. to 1.90c.
Wider than 6 in., Chicago.....	1.75c. to 1.80c.
Cooperage stock, P'gh.....	1.90c. to 2.00c.
Cooperage stock, Chicago.....	2.00c. to 2.10c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.10c.
Bars, f.o.b. Chicago.....	2.10c.
Bars, Cleveland.....	2.10c.
Bars, Buffalo.....	2.10c.
Shafting ground, f.o.b. mill.....	2.45c. to 3.40c.
Strips, P'gh.....	2.35c. to 2.45c.
Strips, Cleveland.....	2.35c. to 2.45c.
Strips, del'd Chicago.....	2.63c. to 2.78c.
Strips, Worcester.....	2.60c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland.....	3.70c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
To Merchant Trade

	Base per Keg
Standard wire nails.....	\$2.05 to \$2.15
Cement coated nails.....	2.05 to 2.15
Galvanized nails.....	4.05 to 4.15

	Base per Lb.
Polished staples.....	2.50c. to 2.60c.
Galvanized staples.....	2.75c. to 2.90c.
Barbed wire, galvanized.....	2.70c. to 2.85c.
Annealed fence wire.....	2.30c. to 2.40c.
Galvanized wire, No. 9.....	2.75c. to 2.85c.
Woven wire fence (per net ton to retailers).....	\$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage.....	2.30c.
Spring wire.....	3.30c.
(Carload lots, f.o.b. Chicago)	
Wire nails.....	\$2.10 to \$2.15 (keg)
Annealed fence wire.....	2.40c. to 2.50c. (lb.)
Bright hard wire to manufacturing trade.....	2.35c.

Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

Light Plates

	Base per Lb.
No. 10, blue annealed, f.o.b. P'gh.....	1.90c. to 2.00c.
No. 10, blue annealed, f.o.b. Chicago dist.....	2.10c.
No. 10, blue annealed, del'd Phila.....	2.32c. to 2.42c.
No. 10, blue annealed, B'ham.....	2.15c.

Sheets

	Blue Annealed	Base per Lb.
No. 13, f.o.b. P'gh.....	2.05c. to 2.15c.	
No. 13, f.o.b. Chicago dist.....	2.25c.	
No. 13, del'd Philadelphia.....	2.44c.	
No. 13, blue annealed, B'ham.....	2.30c.	

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.40c. to 2.45c.
No. 24, f.o.b. Chicago dist. mill.....	2.55c. to 2.65c.
No. 24, del'd Philadelphia.....	2.74c. to 2.84c.
No. 24, f.o.b. Birmingham.....	2.70c.

Steel Furniture Sheets

No. 24, f.o.b. P'gh.....	3.60c. to 3.70c.
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Galvanized

No. 24, f.o.b. Pittsburgh.....	3.00c. to 3.10c.
No. 24, f.o.b. Chicago dist. mill.....	3.15c. to 3.20c.
No. 24, del'd Cleveland.....	3.28½c. to 3.33½c.
No. 24, del'd Philadelphia.....	3.29c. to 3.34c.
No. 24, f.o.b. Birmingham.....	3.25c. to 3.30c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.70c. to 2.80c.
No. 28, f.o.b. Chicago dist. mill.....	2.80c. to 2.90c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	3.60c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	3.55c. to 3.65c.
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Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh.....	3.80c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

	(Per Package, 20 x 28 in.)
8-lb. coating I.C. \$10.30.....	25-lb. coating I.C. \$15.20
15-lb. coating I.C. 12.90.....	30-lb. coating I.C. 16.00
20-lb. coating I.C. 14.00.....	40-lb. coating I.C. 17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series	Alloy	Differential
2000 (¼% Nickel).....	0.25	\$0.25
2100 (1½% Nickel).....	0.55	0.55
2300 (3½% Nickel).....	1.50	1.50
2500 (5% Nickel).....	2.25	2.25
3100 Nickel Chromium.....	0.55	0.55
3200 Nickel Chromium.....	1.35	1.35
3300 Nickel Chromium.....	3.80	3.80
3400 Nickel Chromium.....	3.20	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45	0.45
5100 Chromium Spring Steel.....	0.20	0.20
6100 Chromium Vanadium Bar.....	1.20	1.20
6100 Chromium Vanadium Spring Steel.....	0.95	0.95
9250 Silicon Manganese Spring Steel (flats).....	0.25	0.25
Rounds and squares.....	0.50	0.50
Chromium Nickel Vanadium.....	1.50	1.50
Carbon Vanadium.....	0.95	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¼c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	34.00
Light (from rail steel), f.o.b. mill.....	32.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ½ in. and larger.....	\$2.80
Spikes, ½ in. and smaller.....	2.80
Spikes, boat and barge.....	8.00
Tie plate, steel.....	2.07½

Angle bars.....	\$2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			
Inches	Steel	Galv.	Iron
1½.....	47	21½	¼ and ¾ +11 +36
1½ to 2.....	53	27½	28 5
2.....	58	44½	28 11
2½.....	62	50½	1 and 1½ 31 15
3.....	64	52½	1½ and 2 35 18
Lap Weld			
2.....	57	45½	23 9
2½ to 6.....	61	49½	2½ to 3½ 28 13
7 and 8.....	58	46½	4 to 6..... 30 17
9 and 10.....	56	43½	7 and 8..... 29 16
11 and 12.....	55	42½	9 to 12..... 26 11
Butt Weld, extra strong, plain ends			
1½.....	43	26½	¼ and ¾ +13 +48
1½ to 2.....	49	32½	28 7
2.....	55	44½	28 12
2½.....	60	49½	1 to 2..... 34 18
3.....	63	51½	
3½.....	63	52½	
Lap Weld, extra strong, plain ends			
2.....	55	44½	23 13
2½ to 4.....	59	48½	2½ to 4..... 34 20
4½ to 6.....	58	47½	4½ to 6..... 33 19
7 to 8.....	54	41½	7 and 8..... 31 17
9 and 10.....	47	34½	9 to 12..... 21 8
11 and 12.....	46	33½	

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discount of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2½ in.....	38	1½ in.....	1
2½ in.—2¾ in.....	46	1¾ in.....	8
3 in.....	52	2 in.—2½ in.....	13
3½ in.—3¾ in.....	54	2½ in.—2¾ in.....	16
4 in.....	57	3 in.....	17
4½ in. to 6 in.....	46	3½ in. to 3¾ in.....	18
		4 in.....	20
		4½ in.....	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts: Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in.....	61
1½ to 1¾ in.....	53
1¾ in.....	37
2 to 2½ in.....	32
2½ to 3 in.....	40
3 in.....	46
3½ to 3¾ in.....	48
4 in.....	51
4½, 5 and 6 in.....	40

Hot Rolled

2 and 2½ in.....	38
2½ and 2¾ in.....	46
3 in.....	52
3½ to 3¾ in.....	54
4 in.....	57
4½, 5 and 6 in.....	46

Beyond the above base discount a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30% base (carloads).....	55
Carbon, 0.30% to 0.40% base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

provement, but a few mills are operating at a slightly better rate this week as the result of fairly heavy releases from a few automobile manufacturers. The leading interest has stepped up its schedules about three points, but is still scarcely bettering 50 per cent of capacity. Independents as a whole are not running at quite this high a rate and the average for the industry stands at somewhere between 45 and 50 per cent. Improved demand from makers of radios continues, and manufacturers of steel furniture and office equipment are maintaining their requirements at recent levels. The Government's plans for an extensive road-building program over the next year are expected to stimulate demand for galvanized material for culvert work. Manufacturers of radiator covers and heating and ventilating equipment are fairly busy, but have suffered all year from the low rate of building operations.

Sheet prices are still subject to considerable irregularity despite the efforts of a number of leading makers to maintain recent minimum quotations which are claimed to be less than cost for some mills. Light plates are suffering from competition of heavy plate mills which are rolling very thin gages and seeking business aggressively. The price is now quoted at 1.90c. to 2c., Pittsburgh, for No. 10 gage from jobbing mills, while the continuous mill product is selling at \$4 a ton less. Blue annealed sheets are not so weak, but 2.05c., Pittsburgh, appears regularly on attractive tonnages, against a recent minimum of 2.15c. Black sheets are holding at 2.45c. to 2.55c., although the higher figure is applying to a constantly decreasing tonnage. On galvanized material quoted at 3.10c., jobbers are having no difficulty in getting a differential of \$1 and quite often \$2 a ton. The higher finishes of sheets are unchanged, with little business to test the market.

Tin Plate.—Tin plate makers have not yet felt the effects of the drought in any very tangible way and general reports are rather indefinite. One or two large container manufacturers are not releasing shipments at as high a rate as they might be expected to at this time, but another company has taken a larger tonnage than usual thus far in August from a large tin plate maker. It seems certain that the pack of corn and tomatoes will be considerably curtailed, but the loss may be made up later in other parts of the country, and general rains in the immediate future would still save a large portion of the crop. Mill operations are unchanged, with the leading interest running at better than 70 per cent of capacity and the independents ranging down to less than 50 per cent.

Strip Steel.—Consumers of strip continue to show more interest in their future requirements, but are hesitant in placing orders. In some cases makers are not anxious to take

contracts at the prices named by buyers. Releases from the automobile industry are still restricted and the trend of operations in that quarter during September is clouded. No marked change in mill operations is reported, with hot mills averaging about 40 per cent of capacity and cold-rolling units about 25 per cent. Prices on hot-rolled strip are holding at 1.65c. for material wider than 6 in. and 1.70c. to 1.75c. for the narrower widths. Cold-rolled is unchanged at 2.35c. to 2.45c., Pittsburgh.

Cold-Finished Steel Bars.—Shipments are holding at about the same rate as in July, but new business is in lighter volume. The price is still quoted at 2.10c., Pittsburgh, although prospective buyers are disposed to expect concessions if tonnage were to be placed.

Coke.—Production of furnace coke in the Connellsville region is now fairly well adjusted to demand and less surplus material is being offered than was the case a month ago. Distress material occasionally brings out a price of \$2.50, Connellsville, but dealers generally are able to get \$2.60. Foundry coke is very quiet, with prices weak and unchanged.

Old Material.—Comparatively large purchases of No. 1 heavy melting steel by two mills in the district extended the quotable range on this grade of scrap by 50c. a ton. The average price, however, is advanced only 25c. to \$15.25. A purchase at \$15.75, involving at least 10,000 tons, is said to call for railroad and industrial scrap only, but the fact that the same mill paid only \$15 for its last tonnage clearly indicates the shortage of first grade material in this dis-

trict. The other mill buying shortly before placed orders for slightly less than 10,000 tons among three dealers at \$15 and is reported to have been able to place considerable additional tonnage had it been desired.

In some cases hydraulically compressed sheets may be shipped against this order along with steel. Another buyer secured 1000 tons of hydraulic at \$14.75. Last week's higher figure was occasioned largely by the influence of Western material and this week the market is at a level at which Detroit bundles could hardly come into this district. Sales of borings and turnings in the last week have confirmed recent quotations of \$8.50 to \$9. Scrap rails are higher on the basis of a purchase by the same mill which bought the larger tonnage of heavy melting, and hand-bundled sheets are also stronger. Dealers are still able to pick up heavy melting steel at less than \$15 and rejected cars are bringing considerably less.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel..	\$14.75 to \$15.75
No. 2 heavy melting steel..	12.50 to 13.00
Scrap rails	14.75 to 15.50
Compressed sheet steel....	15.00 to 15.50
Bundled sheets, sides and ends	13.00 to 14.00
Cast iron carwheels.....	15.00 to 15.50
Sheet bar crops, ordinary..	15.50 to 16.00
Heavy breakable cast.....	11.50 to 12.00
No. 2 railroad wrought....	14.75 to 15.75
Hvy. steel axle turnings....	12.50 to 13.00
Machine shop turnings....	8.00 to 8.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	17.50 to 18.00
Railr. coil and leaf springs	17.50 to 18.00
Rolled steel wheels.....	17.50 to 18.00
Low phos. billet and bloom ends	19.50 to 20.00
Low phos. mill plates....	16.50 to 17.00
Low phos. light grades....	16.50 to 17.00
Low phos. sheet bar crops	17.50 to 18.00
Heavy steel axle turnings..	12.50 to 13.00
Electric Furnace Grades:	
Low phos. punchings.....	17.00 to 17.50
Heavy steel axle turnings..	12.50 to 13.00
Blast Furnace Grades:	
Short shoveling steel turnings	8.50 to 9.00
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings.....	8.50 to 9.00
Rolling Mill Grades:	
Steel car axles.....	21.50 to 22.50
Cupola Grades:	
No. 1 cast	13.00 to 14.00
Rails 3 ft. and under....	16.50 to 17.00

Warehouse Prices, f.o.b. Pittsburgh

	*Base per lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes...	2.75c.
Reinforcing steel bars.....	2.75c.
Cold finished and screw stock—	
Rounds and hexagons.....	3.35c.
Squares and flats.....	3.85c.
Bands	3.10c.
Hoops	4.10c.
Black sheets (No. 24), 25 or more bundles	3.50c.
Galv. sheets (No. 24), 25 or more bundles	4.15c.
Light plates, blue annealed (No. 10), 1 to 24 plates.....	2.85c.
Blue annealed sheets (No. 13)....	3.00c.
Galv. corrug. sheets (No. 28), per square	4.03c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count, 60 and 10 per cent off list	
Machine bolts, 100 count, 60 and 10 per cent off list	
Carriage bolts, 100 count, 60 and 10 per cent off list	
Nuts, all styles, 100 count, 60 and 10 per cent off list	
Large rivets, base per 100 lb.	\$3.30
Wire, black, soft ann'l'd, base per 100 lb.....	\$2.60 to 2.70
Wire, galv. soft, base per 100 lb.....	3.20 to 3.30
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.65 to 2.80

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

Two complete stock houses will be built by the Bethlehem Steel Corporation at its No. 5 and No. 6 blast furnaces, at its Johnstown, Pa., works. The contract has been placed with Arthur G. McKee & Co., Cleveland. It is estimated that the amount involved in this improvement, including the furnishing of three double hopper scale cars, will be \$600,000.

Illinois Steel Co. has ordered two disintegrators for its South Chicago plant and four hot blast stove linings for its Gary plant from H. A. Brassert & Co., 310 South Michigan Avenue, Chicago. Inland Steel Co. has contracted with H. A. Brassert & Co. to change its mechanical tower washer to a static tower washer and has ordered two disintegrators for cleaning blast furnace gas.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms	
	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	\$31.00
Rerolling, 4-in. and under 10-in., Youngstown	31.00
Rerolling, 4-in. and under 10-in., Cleveland	31.00
Rerolling, 4-in. and under 10-in., Chicago	32.00
Forging quality, Pittsburgh	36.00

Sheet Bars (Open Hearth or Bessemer)	
	Per Gross Ton
Pittsburgh	\$31.00
Youngstown	31.00
Cleveland	31.00
Slabs (8 in. x 2 in. and under 10 in. x 10 in.)	
	Per Gross Ton
Pittsburgh	\$31.00
Youngstown	31.00
Cleveland	31.00

Skelp (F.o.b. Pittsburgh or Youngstown)	
	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.
Wire Rods (Common soft, base)	
	Per Gross Ton
Pittsburgh	\$36.00
Cleveland	36.00
Chicago	37.00

Prices of Raw Material

Ores	
Lake Superior Ores, Delivered Lower Lake Ports	
	Per Gross Ton
Old range Bessemer, 51.50% iron	\$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40
Foreign Ore, c.i.f. Philadelphia or Baltimore	
	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	.8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	11c.
Iron ore, basic Swedish, average 65% iron	9c.
Manganese ore, washed 52% manganese, from the Caucasus	.26c. to .28c.
Manganese ore, Brazilian, African or Indian, basic 50%	.26c. to .28c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$12.00 to \$14.00
Per Gross Ton	
Chrome ore, 45 to 50% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00
Per Lb.	
Molybdenum ore, 85% concentrates of MoS ₂ , delivered	.50c. to .55c.

Ferromanganese	
	Per Gross Ton
Domestic, 80%, seaboard	\$94.00 to \$99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00
Spiegeleisen	
	Per Gross Ton Furnace
Domestic, 19 to 21%	\$31.00 to \$33.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon	
	Per Gross Ton Delivered
50%	\$83.50
75%	130.00
Per Gross Ton Furnace	
10%	\$35.00
11%	37.00
Per Gross Ton Furnace	
12%	\$39.00
14 to 16%	39.00

Bessemer Ferrosilicon	
F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
10%	\$26.50
11%	28.50
12%	30.50
Per Gross Ton	
13%	\$32.50
14%	34.50
15%	37.00

Silvery Iron	
F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
6%	\$21.50
7%	22.00
8%	22.50
9%	23.50
10%	24.50
Per Gross Ton	
11%	\$26.50
12%	28.50
13%	30.50
14%	32.50
15%	35.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys	
Ferrotungsten, per lb. contained metal del'd	\$1.30 to \$1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	\$91.00
Ferrophosphorus, electric 24%, f.o.b. An-niston, Ala., per gross ton	\$122.50

Fluxes and Refractories

Fluorspar	
	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	\$18.00 to 18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick	
Per 1000 f.o.b. Works	
High-Heat	Intermediate
Duty Brick	Heavy Duty Brick
Pennsylvania	\$43.00 to \$46.00 \$35.00 to \$38.00
Maryland	43.00 to 46.00 35.00 to 38.00
New Jersey	50.00 to 65.00
Ohio	43.00 to 46.00 35.00 to 38.00
Kentucky	43.00 to 46.00 35.00 to 38.00
Missouri	43.00 to 46.00 35.00 to 38.00
Illinois	43.00 to 46.00 35.00 to 38.00
Ground fire clay, per ton	7.00

Silica Brick	
Per 1000 f.o.b. Works	
Pennsylvania	\$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	\$8.50 to 10.00

Magnesite Brick	
	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick	
	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts (F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts	
	Per Cent Off List
Semi-finished hexagon nuts	73
Semi-finished hexagon castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh	80, 10, 10 and 5
Stove bolts in packages, Chicago	80, 10, 10 and 5
Stove bolts in packages, Cleveland	80, 10, 10 and 5
Stove bolts in bulk, P'gh	80, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Chicago	80, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Cleveland	80, 10, 10, 5 and 2 1/2
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets (1/2-in. and larger)	
	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	\$2.75
F.o.b. Chicago	2.85

Small Rivets (3/8-in. and smaller)	
	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws	
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	
	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

CHICAGO

Sales of Steel for Prompt Delivery Gain Sharply and Prospects Are Brighter

CHICAGO, Aug. 19.—This week's changes in the Chicago territory center around the background of the market rather than in definite encouragement in the form of expanding demand for steel mill products. Tank fabricators report numerous orders are in the making and demand for line pipe grows more promising as the fall months draw near. Several railroads are well advanced in the preparation of 1931 budgets, and some rail purchases appear to be near at hand.

Spot sales of finished steel products gained 30 per cent over the volume in the previous week, which, it should be explained, was very quiet. Specifications, mostly in small and mixed lots, show improvement to the extent of 20 per cent. Ingot production, at 55 per cent of capacity, has made sufficient headway to have regained most of the loss suffered a week ago.

In the background of the market is a rather general realization that the harm done by drought may have been overestimated, at least so far as large areas of the corn belt are concerned. Rains over much of the dry section have relieved the situation to the extent that late crops have been benefited and pastures in dairy sections are reviving.

Instability of price structures, noted a week ago, has not disappeared. Galvanized sheets are off \$1 a ton in this market and plates, shapes and bars are being quoted at a flat 1.75c. a lb., Chicago, for all of the ordinary run of business. Extreme competition for business to the east of Chicago is resulting in shading. Greater activity by the automotive group has not reached the point where orders in quantity are reaching this market, nor are parts manufacturers making much impression so far as demand for steel is concerned.

Ferroalloys.—Several specifications have been entered for nearby shipments of ferrosilicon and ferromanganese. Most users have made commitments for the year and consequently sales are dull.

Coke.—Shipments of by-product foundry coke show a marked gain over the first three weeks in July, when inventory periods and vacations were under way. Quotations remain steady at \$8 a ton, f.o.b. local ovens. Spot orders are small in size and few in number.

Pig Iron.—Shipments of Northern foundry iron in the first three weeks of August have topped the corresponding period in July by at least 35 per cent. Much of this iron was taken hurriedly to bring up depleted stocks. Shipments for the remainder of the month may not be so heavy, but it is rather generally estimated that August shipments will run ahead of those of July by 15 to 20 per cent. The melt remains spotty, especially at jobbing foundries. A cargo of Eastern low phosphorus iron has arrived at a Chicago dock. Transactions in silvery are confined to carlots, on which prices show the variations which have prevailed for many weeks. There is little demand for Southern

iron, which is being offered freely at \$12 a ton, Birmingham, or \$18.01 a ton, delivered all rail to Chicago.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$17.50 to \$18.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00 to 18.50
Malleable, not over 2.25 sil.	17.50 to 18.00
High phosphorus	17.50 to 18.00
Lake Super. char'1, sil. 1.50	27.04
S'th'n No. 2 fdy.	18.01 to 18.51
Low phos., sil. 1 to 2, cop-	
per free	29.50
Silvery, sil. 8 per cent.	27.29
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Bolts, Nuts and Rivets.—Although at least three of the farm equipment manufacturers in this district are speeding production, it appears that their stocks of bolts, nuts and rivets are ample for the time being. Their specifications are lighter than would seem warranted by orders at hand.

Plates.—New orders and specifications for plates were well represented in this week's business, which on the

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.90c.
Reinforc'g bars, billet steel—	
Less than 5 tons	2.85c.
5 tons to 30 tons	2.45c.
30 tons to 200 tons	2.00c.
200 tons and over	1.85c.
Rail steel reinforcement—	
Less than 5 tons	2.50c.
5 tons to 30 tons	2.10c.
30 tons and over	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands (3/4 in. in Nos. 10 and 12 gages)	3.10c.
Hoops (No. 14 gage and lighter)	3.65c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'd sheets (No. 10)	3.35c.
Spikes (3/4 in. and larger)	3.55c.
Tracks bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
Per Cent Off List	
Machine bolts	.60 and 10
Carriage bolts	.60 and 10
Coach or lag screws	.60 and 10
Hot-pressed nuts, sq., tap. or blank	.60 and 10
Hot-pressed nuts, sq., tap. or blank	.60 and 10
Hot-pressed nuts, hex., tap., or blank	.60 and 10
No. 8 black ann'd wire, per 100 lb.	\$3.45
Com. wire nails, base per keg	\$2.30 to 2.50
Cement c'd nails, base per keg	2.30 to 2.50

whole was nearly 20 per cent heavier than the average during the first half of August. This improvement, which is worthy of note for the reason that the summer market has been relatively quiet, is somewhat counteracted by the fact that prices for all but small and mixed lots have settled to 1.75c. a lb., Chicago.

Notwithstanding the price situation, the Western plate market is showing some elements of gaining strength.

In the first place, tank manufacturers over a wide territory are reporting that fresh inquiries, many of which are for sizable tonnages, will soon come out for figures. The Elgin, Joliet & Eastern will take about 6000 tons of steel for 300 flat and 250 gondola cars which it will build in its own shops. Although car shops generally are rapidly working down their order books, they continue to issue fair specifications from week to week. This week's releases were unusually large at 3500 tons.

A subsidiary of the Central Public Service Corporation is planning a 260-mile gas distributing line from Kentucky fields to points in the Ohio River valley. While developments of this kind are taking shape, the manufacture of electrically welded pipe is holding to a steady pace, as evidenced by heavy shipments of pipe-size plates from Chicago mills. Deliveries are prompt on practically all sizes of plates.

Structural Material.—Activity displayed by the structural market a week ago is not in evidence now. It is true that the number of inquiries is gradually creeping up, but they are for small tonnages and therefore do not give the support needed to a market characterized by low prices and extreme competition. Shops are operating on greatly reduced schedules in the absence of normal summer backlogs.

New contracts this week are for less than 2000 tons. Fresh inquiries call for about 3000 tons, not including a bridge program which will be undertaken by the State of Kentucky. These bridges, it is said, will take 16,000 tons of steel. Plans are under way for a bridge across the Ohio River at Evansville, Ind., that will require 8000 tons. The elevated lines in Chicago are in the market for 1200 tons for extensions to platforms. This is one of the first moves to be made following the passage in July of the new traction ordinance. Figures are being taken on sections of the north approach of the outer bridge across the Chicago River. A round tonnage will be needed for this bridge, which will be of the lift type. Most sellers are now offering structural shapes at 1.75c. a lb., Chicago, except in very small and mixed lots.

Bars.—New orders for bar mill products have held the gains made a week ago, and inquiry indicates that further improvement may not be far in the future. However, concurrent with this situation is a settling of prices to the 1.75c. level on all except very small and mixed tonnages.

There is little change in the automobile industry as reflected in parts makers' activities in this district. However, forge shops are finding inquiries more numerous from miscellaneous sources. Specifications for bars from manufacturers of agricultural machinery continue to grow, but the bulk of support of the farm machinery market still comes from orders for export. Builders of road machinery are still well engaged, as shown by their releases for steel mill products. Rail steel bars, now quotable at 1.65c., Chicago Heights mill, are in spotty demand. Orders for fence posts made from old rails are very scarce when in fact they usually are in good demand at this time of the year for shipment during the late summer and early fall.

Warehouse Business.—Distribution of steel mill products from local warehouses is in moderate volume for this time of year. Prices of plates, shapes, soft steel bars, hoops and bands have been lowered 10c. a 100 lb.

Wire Products.—Distribution of wire products continues to improve in many rural districts where, as a general rule, stocks are low and, as a result, increases in demand are quickly felt at mills. Although some sections of the country still report drought conditions, there are many areas that have had rains and now are enjoying lower temperatures. The result is that sentiment, so far as rural trade is concerned, is improving on the score that late crops are being benefitted by rains and pastures will be revived.

Orders for manufacturers' wire remain light, and there are few indicators that point the way to betterment in the near future. Lack of building activity continues to be reflected in shipments of nails, which have been light most of the summer. Deliveries of concrete road mesh remain in good volume, and new business that is taking shape promises substantial shipments well up to the time when cold weather will put an end to pavement construction.

Rails and Track Supplies.—New releases of standard-section rails are at the rate of the previous week. Some of this tonnage is against business recently taken and a part of it is against old commitments that were not taken out in full earlier in the year. The Chicago surface lines have ordered 1000 tons of rails for extensions that are to be laid this fall. Purchase of 9000 tons of rails by the Great Northern may be delayed at least 30 days for the reason that some preliminary work, such as grading and the like, is behind schedule. Releases of track supplies are spotty. A few small pur-

Spot sales of finished steel products gain 30 per cent over those of preceding week, while contract specifications increase 20 per cent.

* * *

Prospects for expanding business grow more promising, and include projects for line pipe, oil tanks and rails.

* * *

Pig iron shipments, so far this month, 35 per cent ahead of same period last month; average gain for August expected to be at least 15 to 20 per cent.

* * *

Heavy melting steel shows moderate strength on consumer purchases.

chases to complete current rail laying programs are noted.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars 2.75c.

Cast Iron Pipe.—Fresh inquiry this week is in moderate volume. However, several requests for prices on large tonnage have come from municipalities. Toledo, Ohio, will close this week on 1500 tons of 16 to 24-in. pipe and Minneapolis, Minn., is in the market for 6800 ft. of 24-in. and 2000 ft. of 8-in. pipe. Fond Du Lac, Wis., is taking bids on 4600 ft. of 20-in. class C pipe. Prices are steady on the general run of business.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$45 to \$46; 4-in., \$48 to \$49; Class A and gas pipe, \$3 extra.

Reinforcing Bars.—This week's transactions in reinforcing bars are confined almost wholly to lots of less than 100 tons each. Work of this kind is slowly gaining headway, while large tonnage projects are less in evidence than in June and July. General contracts have been let for Illinois highway work, which will take 1000 tons of bars. Much of this tonnage will be placed with dealers in the next few days. Shop operations show no gain. Production is being hampered not only by the comparatively low sales volume, but financial difficulties have forced suspension of construction on several large undertakings. Competition remains keen and prices show wide variation.

Sheets.—Buyers are pressing hard against the sheet price structure. Although prices for black sheets are fairly stable in the local market, shading is reported to be rather common to the east of Chicago. Sales of galvanized sheets in the local market disclose that prices have dropped \$1

a ton to a range of 3.15c. to 3.20c. a lb., local mill. Sellers are blaming the drought for the dullness of the roofing trade, which is normally quite active at this time of year. Jobbers are distributing fair quantities, but because of prompt deliveries by mills they are buying at extremely close range.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.60c. to 2.70c.; No. 24 galv., 3.20c. to 3.25c.; No. 10 blue ann'd, 2.15c. *Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.*

Old Material.—Consumer purchases of heavy melting steel have disclosed a new price which is 25c. a ton above the nominal quotation of a week ago. The quantity involved is said to have been about 8000 tons. Immediately following the placing of these orders, a large consumer restricted incoming shipments. This move had the immediate effect of modifying any optimism which may have been built about the apparent price advance of 25c. A producer has disposed of cast iron borings at \$8.56 a gross ton, delivered. Brokers have been trading in this grade at \$8 to \$8.25.

Prices deliv'd Chicago district consumers: Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$12.00 to \$12.25
Shoveling steel	12.00 to 12.25
Frogs, switches and guards, cut apart, and misc. rails	13.00 to 13.50
Hydraul. compressed sheets	10.25 to 10.75
Drop forge flashings.....	8.50 to 9.00
No. 1 busheling	9.50 to 10.00
Forg'd cast and r'd steel carwheels	15.00 to 15.50
Railroad tires, charg. box size	15.50 to 16.00
Railroad leaf springs cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.50 to 14.00
Coil springs	16.00 to 16.50
Electric Furnace Grades:	
Axle turnings	11.25 to 11.75
Low phos. punchings.....	13.00 to 13.50
Low phos. plates, 12 in. and under	13.00 to 13.50
Blast Furnace Grades:	
Axle turnings	9.50 to 10.00
Cast iron borings.....	7.75 to 8.25
Short shoveling turnings.....	7.75 to 8.25
Machine shop turnings....	6.00 to 6.50
Rolling Mill Grades:	
Iron rails.....	13.00 to 13.50
Rerolling rails	14.50 to 15.00
Cupola Grades:	
Steel rails, less than 3 ft..	13.75 to 14.25
Steel rails, less than 2 ft..	14.50 to 15.00
Angle bars, steel	13.25 to 13.75
Cast iron carwheels.....	13.50 to 14.00
Malleable Grades:	
Railroad	13.50 to 14.00
Agricultural	12.50 to 12.75
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angle and splice bars	12.00 to 12.50
Iron arch bars and transoms	13.50 to 14.00
Iron car axles.....	21.50 to 22.00
Steel car axles.....	15.00 to 15.50
No. 1 railroad wrought....	9.75 to 10.25
No. 2 railroad wrought....	10.75 to 11.00
No. 1 busheling.....	7.50 to 8.00
No. 2 busheling.....	6.00 to 6.50
Locomotive tires, smooth...	14.50 to 15.00
Pipes and flues.....	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast.....	12.00 to 12.50
No. 1 railroad cast.....	10.25 to 10.75
No. 1 agricultural cast.....	9.50 to 10.00
Stove plate.....	8.50 to 9.00
Grate bars	8.50 to 9.00
Brake shoes.....	8.50 to 9.00

*Relaying angle rails, including angle bars to match, are quoted f.o.b. dealers' yards.

NEW YORK

Irregularity in Steel Prices Persists— Pig Iron Sales 5000 Tons

NEW YORK, Aug. 9.—While sales of pig iron in the past week totaled only about 5000 tons, sellers are inclined to an optimistic view of the market based on the wide range of consumers contributing to this total. New inquiry is meager. With orders limited to small tonnages, there has been no occasion for price concessions except occasionally to meet Southern competition, so that \$16 a ton, Buffalo, is fairly well maintained on foundry iron. The Southern pig iron producers have recently renewed their efforts to increase business in the North, and \$12 a ton, f.o.b. Birmingham furnace, has been frequently quoted when a tonnage sufficient for an ocean-going barge was in prospect. In a few cases consumers who have not used Southern foundry iron have expressed willingness to try small amounts. One important user has been inquiring for about 200 tons of Birmingham iron, evidently for a trial.

The Worthington Pump & Machinery Corporation has closed for about 400 tons of special analysis foundry iron for Elmwood Place, Ohio, and has not yet placed about 500 tons of Nos. 1X and 2X iron for its Buffalo plant. Other current inquiry consists of lots ranging from a carload to 500 tons. Shipment of pig iron from Buffalo furnaces by barge, which has been smaller this summer than a year ago, is declining still further, with the beginning of the usual fall grain movement through the canal.

Prices per gross ton, delivered New York district:
Buffalo No. 2 fdy., sil. 1.75 to 2.25 \$20.91
*Buff. No. 2, del'd east. N. J. 19.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25 \$18.89 to 19.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75 18.89 to 19.89

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

Cast Iron Pipe.—Buying of pressure pipe is still small, but Northern foundries are maintaining operations at about 70 per cent. Prices range from \$36 to \$37 a net ton. Bids have been opened by Bedford Hills, N. Y., on 875 tons of 6 to 12-in. water pipe and by Owasco, N. Y., on 353 tons of 6-in. pipe with fittings. Private buying continues to provide a substantial part of current business, but individual purchases are small.

Prices per net ton deliv'd New York:
Water pipe, 6-in. and larger, \$38.90 to \$39.90; 4-in. and 5-in., \$41.90 to \$42.90; 3-in., \$48.90 to \$49.90. Class A and gas pipe, \$3 extra.

Warehouse Business.—The total of orders is small, but business is coming from a wide range of consumers, some of which have been quite inactive for a number of months. Prices of black,

galvanized and blue annealed sheets are still subject to shading, and additional discounts are being granted on bolts and screws.

Finished Steel.—No turning point in the demand for steel products has yet appeared in this district. On the whole, the market is extremely quiet, and occasional reports of improved buying have no broad significance. The structural steel demand is the most active. A good deal of work is still pending award, and it is believed that much of this will be closed soon, as prices quoted are so extremely low that buyers of fabricated material are said to be convinced they will not go lower. On ordinary tonnages of structural steel, 1.70c., Bethlehem, still represents the market, but this price is usually shaded on attractive projects. On steel frames, fabricated and erected, as low as \$70 a ton has been quoted. The sheet market remains weak. Prices that recently were granted only to a favored few customers have been given to a wider circle of buyers. Thus, sales of black sheets at 2.40c., Pittsburgh, have become more frequent, while jobbers are able to buy galvanized sheets at 3c. and 3.05c., Pittsburgh.

Outstanding structural steel awards include 10,000 tons for a Lehigh Valley Railroad warehouse.

Reinforcing Bars.—The largest award of the week was 1250 tons for

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars, small shapes.....	3.10c.
Iron bars.....	3.24c.
Iron bars, Swed. charcoal.....	7.00c. to 7.25c.
Cold-fin, shafting and screw stock—	
Rounds and hexagons.....	3.40c.
Flats and squares.....	3.90c.
Cold-roll, strip, soft and quarter	
hard.....	4.95c.
Hoops.....	3.75c.
Bands.....	3.40c.
Blue ann'd sheets (No. 10).....	3.25c. to 3.40c.
Black sheets (No. 24*).....	3.65c. to 3.90c.
Galvanized sheets (No. 24*).....	4.25c.
Long term sheet (No. 24).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galv. annealed.....	5.15c.
Tire steel, ½ x ½ in. and larger.....	3.40c.
Smooth finish, 1 to 2 ½ x ¾ in.	
and larger.....	3.75c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent
Machine bolts, cut thread:	Off List
¾ x 6 in. and smaller.....	.65
1 x 30 in. and smaller.....	.65
Carriage bolts, cut thread:	
¾ x 6 in. and smaller.....	.65
¾ x 20 in. and smaller.....	.65
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.....	\$19.00
Seamless steel, 2-in.....	20.25
Charcoal iron, 2-in.....	26.25
Charcoal iron, 4-in.....	67.00
Tin Plate (14 x 20 in.)	

	Prime	Seconds
Coke, 100 lb. base box.....	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC.....	\$9.70	\$12.10
IX.....	12.00	14.25
IXX.....	13.90	16.00

the approaches on the New York side of the Hudson River bridge. Of this tonnage, 1000 tons is in bars and 250 tons in bar trusses. Prices are unchanged. For mill shipment, distributors quote 1.75c. to 1.85c., Pittsburgh, while small lots from warehouse range from 2.40c. to 2.50c.

Coke.—Some contracting for both furnace and foundry coke is expected to develop during the next few weeks. Meanwhile the furnace coke market is unchanged at \$2.50 to \$2.60 a net ton, Connellsville, and foundry coke prices are as follows:

Special brands of beehive foundry coke, \$4.85 a net ton, ovens, or \$8.56 delivered to northern New Jersey, Jersey City and Newark, and \$9.44 to New York and Brooklyn; by-product foundry coke, \$9 to \$9.40, Newark or Jersey City; \$10.06, New York or Brooklyn.

Old Material.—Activity in the scrap market largely centers about heavy melting steel. Brokers buying for eastern Pennsylvania delivery of No. 1 steel are offering \$12.50 a ton, delivered, based on sales to consumers at \$13 a ton, but are only obtaining a limited tonnage at this price. Meanwhile, a broker buying No. 1 steel for barge delivery from New York to Buffalo steel mills has begun offering \$10.25 to \$10.50 a ton, on barge, for delivery to the Lackawanna plant of the Bethlehem Steel Co. and is continuing to pay \$10 a ton for shipment to other steel mills in Buffalo. No. 2 heavy melting steel is also being bought for Buffalo, brokers offering \$8 to \$9, on barge, New York, depending upon the consumer. This compares with \$6.75, offered by brokers for No. 2 steel for shipment to Conshohocken, Pa. In addition to the unusual movement of heavy melting steel from the New York district to Buffalo, a small tonnage is going to mills in western Pennsylvania at higher prices to the dealer here than are obtainable for eastern Pennsylvania delivery.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel..	\$9.00 to \$10.50
Heavy melting steel (yard)	5.75 to 6.25
No. 1 hvy. breakable cast.	7.75 to 8.50
Stove plate (steel works)...	6.00 to 6.25
Locomotive grate bars....	6.00 to 6.50
Machine shop turnings....	5.90 to 5.25
Short shoveling turnings..	4.50 to 5.00
Cast borings (blast fur. or steel works)	4.50 to 5.00
Mixed borings and turnings.....	4.50 to 5.50
Steel car axles.....	17.00
Iron car axles.....	19.00 to 19.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.25
Forge fire.....	7.50
No. 1 railroad wrought.....	9.75
No. 1 yard wrought, long.....	8.75
Rails for rolling.....	9.50 to 10.00
Stove plate (foundry).....	6.50
Malleable cast (railroad)...	10.50 to 11.00
Cast borings (chemical)...	8.50 to 9.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast.....	\$14.00
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size	12.00
No. 2 cast (radiators, cast boilers, etc.)	11.50

PHILADELPHIA

Plate Price Off \$1 a Ton—Galvanized Sheets Lower

PHILADELPHIA, Aug. 19.—Steel buying continues at the same level as in recent weeks, but prices are lacking in firmness and sentiment is slightly less optimistic. Concessions of \$1 a ton in the price of plates have culminated in a reduction to 1.70c. per lb., Coatesville, Pa., by one eastern Pennsylvania interest, and other producers are revising their prices on moderate sized tonnages to this level, which is equivalent to \$1 a ton lower price than the present Pittsburgh quotation. Mill operations continue at about 50 per cent of capacity in the rolling departments and ingot output is at a still lower level.

Much of the steel tonnage for ships recently awarded to Eastern shipyards is not expected to be placed with the mills for some weeks. A ship for the Red "D" line, requiring about 1500 tons of plates has been awarded to the Pusey & Jones Co., Wilmington, Del., preference having been given to an Atlantic coast builder. Fabrication of two unusually large boilers for the Brooklyn Edison Co., a \$2,000,000 contract in which eastern Pennsylvania plate mills have been interested, is understood to have gone to a Louisville, Ky., fabricating shop.

Pig Iron.—Only small tonnages of foundry iron are being bought by eastern Pennsylvania consumers and on this business \$18.50 per ton, furnace, is generally maintained. Southern pig iron continues a factor in the market, and Birmingham furnaces have quoted \$12 per ton, base, or \$17.25 per ton, on cars, Philadelphia, which is 50c. a ton down. In the absence of inquiries for basic iron, the market is quotable at \$18.25 to \$18.50 per ton, but with Buffalo sellers recently offering to meet this level of prices keen competition would be regarded as not unlikely when a formal inquiry appears from an eastern Pennsylvania user. In the past week a New Jersey consumer closed on a small tonnage of Bessemer iron.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$19.26 to \$19.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	19.76 to 20.26
East. Pa. No. 1X, 2.25 to 2.75 sil.	20.26 to 20.76
Basic (del'd east. Pa.)	18.25 to 18.50
Malleable	21.25
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

Steel Bars.—The quotation is unchanged at 1.65c. per lb., Pittsburgh, or 1.94c., delivered Philadelphia, and buying is limited to lots of considerably less than a carload.

Reinforcing Bars.—Projects requir-

ing reinforcing bars are small and individual tonnages are generally of a carload or less. Billet steel bars are quoted at 1.75c. to 1.85c. per lb., Pittsburgh, or 2.04c. to 2.14c., delivered Philadelphia. Rail steel bar prices range from 1.55c. to 1.60c. per lb., Franklin, Pa., or 1.84c. to 1.89c., delivered Philadelphia.

Shapes.—Efforts to maintain the price for small and medium sized tonnages of shapes at a minimum of 1.65c. per lb., f.o.b. nearest mill to consumer, have not met with success and the market still ranges from 1.60c. to 1.65c., mill, or 1.66c. to 1.71c. per lb., Philadelphia, with the minimum price occasionally shaded \$1 a ton on the larger tonnages. Fabricators are bidding on some sizable projects, including a section of subway on Market Street requiring about 6000 tons and a telephone building, 1000 tons. One eastern Pennsylvania fabricator has recently booked a total of more than 3000 tons of steel in bridges for the Erie and Boston & Maine railroads.

Plates.—The quotation has been reduced to 1.70c. per lb., Coatesville, Pa., or 1.805c., delivered Philadelphia, by one eastern Pennsylvania mill, and other producers are quoting this price on medium-sized tonnages. On small lots of plates totaling only a few tons 1.75c. per lb. is still quoted by some sellers, while on large orders the 1.70c., Coatesville, price is occasionally shaded \$1 a ton.

Sheets.—Prices are lacking in firmness with mills seeking tonnage to maintain present rates of operation. A radio manufacturer in this district, which planned to produce 7000 to 9000 sets a day in August, is operating on a schedule of about one-third this total and another large radio maker here is on a schedule of 3000 sets a day. Blue annealed sheet prices continue unsteady on the narrower specifications where competition is

encountered from the product of the continuous mill. The wider jobbing mill sizes of blue annealed sheets, No. 13 gage, are fairly firm at 2.15c. a lb., Pittsburgh, or 2.44c., delivered Philadelphia, with the narrower sheets at about 2.05c., Pittsburgh, or 2.34c., Philadelphia. Blue annealed plates range from 1.90c. to 2c. per lb., Pittsburgh, or 2.19c. to 2.29c., delivered Philadelphia. Blue annealed plates from the continuous mill have been offered in Baltimore and this district at concessions from 1.90c., Pittsburgh. Eastern Pennsylvania capacity for blue annealed sheet production will be increased with the addition of an 84-in. mill at the Worth Steel Co., Claymont, Del. Black sheets continue at 2.45c. per lb., Pittsburgh, or 2.74c., delivered Philadelphia, but galvanized sheets are lacking in firmness and sales at 3c. per lb., Pittsburgh, or 3.29c., Philadelphia, are becoming more common, 3.05c., Pittsburgh, or 3.34c., Philadelphia, applying only on the small orders of considerably less than a carload.

Imports.—In the week ended Aug. 16, arrivals at this port consisted of 2770 tons of pig iron from British India, 20 tons of structural shapes from Germany and 1 ton of drill steel from Sweden.

Old Material.—Two purchases of No. 1 heavy melting steel in the past week justify continued quotation of \$12.50 to \$13 per ton, delivered to eastern Pennsylvania consumers. One mill bought about 2000 tons at \$12.50 per ton, delivered, and another, larger user, contracted for a considerable tonnage at \$13 per ton, delivered. Other grades of scrap are inactive and the prices are unchanged.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$12.50 to \$13.00
No. 2 heavy melting steel	10.00 to 10.50
Heavy melting steel (yard)	10.00
No. 1 railroad wrought	14.75 to 15.00
Bundled sheets (for steel works)	9.50
Hydraulic compressed, new	11.00 to 11.50
Hydraulic compressed, old	9.50
Machine shop turnings (for steel works)	9.00
Heavy axle turnings (or equiv.)	11.50 to 12.00
Cast borings (for steel works and roll. mill)	8.75 to 9.00
Heavy breakable cast (for steel works)	11.50 to 12.00
Railroad grate bars	10.00
Stove plate (for steel works)	10.00
No. 1 low phos., hvy., 0.04% and under	20.00
Couplers and knuckles	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
No. 1 blast f'nace scrap	8.50
Wrot. iron and soft steel pipes and tubes (new specific.)	11.50 to 12.00
Shafting	18.00 to 18.50
Steel axles	21.00 to 21.50
No. 1 forge fire	11.50 to 12.00
Cast iron carwheels	14.50 to 15.00
No. 1 cast	13.00 to 13.50
Cast borings (for chem. plant)	13.50 to 14.00
Steel rails for rolling	13.50 to 14.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier	2.60c.
Structural shapes	2.60c.
Soft steel bars, small shapes, iron bars (except bands)	2.70c.
Reinforc. steel bars, sq., twisted and deform.	2.60c. to 2.70c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.25c.
Steel bands, No. 12 to 1/8-in. incl.	3.00c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.70c.
†Galvanized sheets (No. 24)	4.25c.
Light plates, blue annealed (No. 10)	3.15c.
Blue ann'd sheets (No. 13)	3.30c.
Diam. pat. floor plates, 1/4-in.	5.30c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

CLEVELAND

Orders for Heavy Steel Products Gain Slightly—Bars Decline \$1 a Ton

CLEVELAND, Aug. 19.—Demand for finished steel shows virtually no change. Some of the mills report a slight improvement in orders for the heavier rolled steel products, but they are for small lots. August is expected to end with about the same volume of business as July. Orders from the automotive industry have improved very slightly. A few of the stamping plants and forge shops doing automobile work have had a little pickup in business. Some metal-working plants have resumed part-time operations after the vacation suspensions, but do not have much business on their books. Metal-working industries in this territory appear to be operating at about 35 to 40 per cent of capacity.

Steel plant operations in Cleveland were reduced this week by the shutting down of two open-hearth furnaces. These plants are now operating 14 open-hearths, or at 41 per cent of ingot capacity. The market has a weak tone.

The Cleveland price on steel bars has been reduced \$1 a ton, and concessions to 1.60c., Pittsburgh, on plates have become frequent. The price on black sheets has settled to 2.45c., Pittsburgh, which previously had been the usual minimum quotation, and prices on blue annealed and galvanized sheets reflect marked weakness.

Pig Iron.—Shipments show some gain over last month, but the improvement is not noticed by all producers. One interest reports that its August shipments will be about 33 per cent larger than during July. The market is quiet, although one producer sold 7500 tons during the week. Some of the recent buying resulted from belief by consumers that present prices are attractive rather than from any immediate need of the iron. Business with jobbing foundries continues light. Competitive conditions are still bearing down on prices for shipments to some competitive points. Some tonnage of foundry iron has been sold at \$16.75, although \$17 is still the ruling Lake furnace quotation for both foundry and malleable grades for delivery in northern Ohio and Indiana. In Michigan, the \$18 price still prevails. Cleveland furnaces adhere to \$18, furnace, for local delivery.

Prices per gross ton at Cleveland:
N'th'n fdy., sil. 1.75 to 2.25 \$18.00
S'th'n fdy., sil. 1.75 to 2.25 \$18.51 to 19.51
Malleable 18.00
Ohio silvery, 8 per cent... 25.50 to 25.50
Basic Valley furnace.... 18.50
Stand. low phos., Valley... 26.50 to 27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

Iron Ore.—Shipments of Lake Superior ore are not holding up to recent volume. The season's movement is expected to fall below 50,000,000 tons, and some predict that it will not be much in excess of 45,000,000 tons. Consumption of Lake ore during July was 3,837,567 tons, compared with 5,808,473 tons during the same month last year, according to the monthly report of the Lake Superior Iron Ore Association. July showed a decrease of 450,904 tons compared with June. The amount of Lake ore in furnace yards and on docks Aug. 1 was 30,-

515,437 tons, compared with 28,697,239 tons on the same date a year ago. There were 130 furnaces using Lake ore in blast July 31, a decrease of 13 for the month. Central district furnaces in July consumed 1,996,682 tons, a decrease of 126,687 tons. Lake front furnaces used 1,698,093 tons, a decrease of 307,539 tons. Eastern furnaces consumed 47,089 tons, a decrease of 14,332 tons, and all-rail furnaces used 95,703 tons, a decrease of 2346 tons.

Bars, Plates and Shapes.—Orders are somewhat more numerous than recently, but they are for small lots. Demand for bars from forge shops and other plants serving the automotive industry continues light. Little new structural work is coming out. Steel bar prices, which have remained steady for some time, have declined \$1 a ton to 1.65c., Cleveland, for outside shipment and to 1.70c. for local delivery. Weakness exists in plates, which range from 1.60c. to 1.65c., Pittsburgh. Although concessions are reported on structural shapes, these appear to be rather generally maintained at 1.65c.

Wire Products.—Demand continues slow. Prices are steady at \$2.05 per keg, Cleveland, for nails to jobbers and at \$2.15 to the manufacturing trade and to dealers. Manufacturers' wire remains at 2.30c. a lb.

Sheets.—The volume of business shows no improvement, orders being slow from all consuming industries. Prices still show a sagging tendency, quotations that have been minimum

having become more common. Prices above 2.45c., Pittsburgh, have virtually disappeared on black sheets. While this is being generally maintained, some shading is reported. Quotations of 2.40c. have been made to some of the barrel manufacturers. On blue annealed sheets, jobbing mills are now quoting 2.05c. quite generally, 2.15c. apparently having about disappeared. Galvanized sheets have quite generally settled to a maximum of 3.10c., and 3c. is being quoted to jobbers. Concessions to 3.60c. have appeared on metal furniture sheets.

Strip Steel.—Demand for hot and cold-rolled strip continues very slow. While prices are untested on lots of any size, wide strip appears to be holding at 1.65c. Pittsburgh. On cold-rolled strip, 2.35c., Cleveland, is now quite generally quoted, although some of the mills are adhering to 2.45c. for less than car lots.

Coke.—Some activity is developing in by-product domestic coke as with the approach of fall stock orders are coming from some of the dealers. Prices are unchanged at \$3.50 for nut and \$4 for egg coke. The \$7.75, oven, price for Ohio by-product foundry coke will probably be reestablished for September. The Cleveland Cliffs Iron Co. has taken over the sale of the by-product coke of Corrigan, McKinney & Co., Cleveland.

Old Material.—With shipments to a leading consumer still suspended, dealers have no local orders to fill and the market is virtually at a standstill. The amount of scrap coming on the market is light, as producers are not making much effort to move the limited amount they are accumulating. There is no change in the price situation and in the absence of transactions quotations are nominal.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel...	\$11.75 to	\$12.25
No. 2 heavy melting steel...	11.25 to	11.50
Compressed sheet steel...	12.25 to	12.50
Light bundled sheet		
stampings	11.00 to	11.50
Drop forge flashings....	10.00 to	10.50
Machine shop turnings....	8.00 to	8.50
Short shoveling turnings...	9.75 to	10.25
No. 1 railroad wrought....	13.00 to	13.50
No. 2 railroad wrought....	14.00 to	14.50
No. 1 busheling.....	11.75 to	12.00
Pipes and flues.....	9.00 to	9.50
Steel axle turnings.....	12.50 to	13.00
Acid Open-Hearth Grades:		
Low phos. forging crops..	17.75 to	18.00
Low phos. billet bloom		
and slab crops	18.50 to	18.75
Low phos. sheet bar crops	18.00 to	18.50
Low phos. plate scrap....	18.00 to	18.50
Blast Furnace Grades:		
Cast iron borings	9.00 to	9.25
Mixed borings and short		
turnings	9.00 to	9.25
No. 2 busheling	8.75 to	9.00
Cupola Grades:		
No. 1 cast.....	15.00 to	15.50
Railroad grate bars.....	11.00 to	12.00
Stove plate.....	12.00 to	12.50
Rails under 3 ft.....	18.50 to	19.50
Miscellaneous:		
Rails for rolling.....	16.25 to	16.50
Railroad malleable.....	16.00 to	16.50

Warehouse Prices, f.o.b. Cleveland

Base per Lb.	
Plates and struc. shapes.....	2.95c.
Soft steel bars	2.85c.
Reinforc. steel bars.....	2.25c. to 2.50c.
Cold-fin. rounds and hex.....	3.40c.
Cold-fin. flats and sq.....	3.90c.
Hoops and bands, No. 12 to 1/4 in., inclusive	3.10c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip.....	5.95c.
Black sheets (No. 24).....	3.80c.
Galvanized sheets (No. 24).....	4.35c.
Blue ann'd sheets (No. 10).....	3.10c.
No. 9 ann'd wire, per 100 lb.....	\$2.50
No. 9 galv. wire, per 100 lb.....	2.95
Com. wire nails, base per keg.....	2.40

*Net base, including boxing and cutting to length.

ST. LOUIS Scrap Market Firmer—Interest in Pig Iron at Low Ebb—Steel Buying Poor

ST. LOUIS, Aug. 19.—Pig iron consumers are showing little interest in supplies, either for immediate or future use. Buying is confined to small lots for prompt delivery, the total tonnage reported being slightly under 2000 tons. The business was about equally divided between Northern and Southern makers. Inquiry for fourth quarter iron is entirely absent, and most mills will be able to carry through the present period with stocks in their reserve piles or under contract. Passing of the extreme hot spell has resulted in increased activities at certain foundries, but the melt as a whole is below the average rate obtaining through July, and fully 40 per cent below the rate at the corresponding time last year. Malleable shops are not receiving expected releases on automobile castings, and some are heavily loaded with parts awaiting shipping directions.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	\$18.00 to \$18.50
Malleable, f.o.b. Granite City	18.00 to 18.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	16.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Finished Steel.—The demand for finished steel remains quiet, both with reference to new orders and specifications against obligations. Aside from materials for river, highway and municipal improvement work, warehouse commodities show little activity. Wire and wire products and all other materials consumed principally in the rural areas are quieter than at any time in a decade, the prolonged drouth and resultant reduced crop prospects having reduced buying to a minimum. Tin plate is moving in about seasonal volume, and some improvement in de-

mand for galvanized sheets from the South and Southwest is noted. Structural fabricators report a dearth of new lettings.

Old Material.—Scrap iron and steel has developed quite noticeable firmness, particularly items for the steel mills. Railroads are getting good prices for all they market, frequently more than dealers are able to turn the same material over for. The betterment in tone is due entirely to dealers' activity. There is some short interest outstanding, and generally the middlemen think the bottom has been reached, and they would rather purchase for investment than sell. Nothing is coming in from the country, and is not likely to for a considerable time. The industries are producing very little scrap. Full reliance for supplies is upon the carriers, and their offerings have decreased markedly in recent weeks. Latest lists before the trade were: Cotton Belt, 8 cars; Santa Fe, 5555 tons; Missouri, Kansas &

Texas, 2300 tons; Frisco, 24 cars; Rock Island, 60 cars; Burlington, 3830 tons; Chicago & Alton, 2400 tons; and International Great Northern, 600 tons.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	\$11.50 to \$12.00
No. 1 heavy melting or shoveling steel	10.75 to 11.25
No. 2 heavy melting or shoveling steel	10.00 to 10.50
No. 1 locomotive tires	13.00 to 13.50
Misc. stand-sec. rails including frogs, switches and guards, cut apart	11.50 to 12.00
Railroad springs	14.00 to 14.50
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 bushing	9.50 to 10.00
Cast iron borings and shoveling turnings	9.25 to 9.50
Iron rails	10.00 to 11.00
Rails for rolling	12.50 to 13.00
Machine shop turnings	6.75 to 7.25
Heavy turnings	9.25 to 9.75
Steel car axles	16.00 to 16.50
Iron car axles	21.50 to 22.00
Wrot. iron bars and trans.	14.00 to 14.50
No. 1 railroad wrought	9.00 to 9.50
Steel rails, less than 3 ft.	14.00 to 14.50
Steel angle bars	11.00 to 11.25
Cast iron car wheels	12.00 to 12.50
No. 1 machinery cast	11.50 to 12.00
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	11.00 to 11.50
Stove plate	9.00 to 9.50
Relay, rails, 60 lb. and under	20.50 to 23.50
Relay, rails, 70 lb. and over	26.50 to 29.00
Agricult. malleable	10.00 to 10.50

PACIFIC COAST

Award Made of 2500 Tons of Reinforcing Bars for Ford Plant

LOS ANGELES AND SAN FRANCISCO, Aug. 16.—(By Air Mail.)

—While new inquiries are slow in coming forth, several fair-sized awards were placed during the past week. Outstanding among these were 2500 tons of reinforcing steel bars for the Ford Motor Co. plant at Richmond, Cal., booked by the Soule Steel Co., and 1480 tons of cast iron pipe for Santa Monica, Cal., placed with C. G. Claussen & Co., Inc., who will furnish French material.

Reinforcing steel bar bookings exceeded 3700 tons. Unnamed interests took 420 tons and 415 tons respectively for the Sixth Street viaduct and the Washington Street bridge, both in Los Angeles. More than 1100 tons of new inquiries came up for figures, the largest projects calling for 300 tons for an apartment in Los Angeles and for 300 tons for a hotel addition in Pasadena. Out-of-stock prices remain unchanged, in the San Francisco district, 2.50c., base, on carload lots applying, and in the Los Angeles district 2.40c., base, being general.

Plate awards were confined to lots of less than 100 tons. The only new inquiry of importance calls for 1500 tons for a 20 and 24-in. welded steel or reinforced concrete pipe line for Anacortes, Wash., bids on which will be opened Sept. 5. It is reported that bids will shortly be called for by Seattle for 26,000 ft. of 48-in. steel pipe, involving 10,000 tons of plates. Prices range from 2.15c. to 2.25c., c.i.f. Included among the more important

Pig iron prices per gross ton at San Francisco:

*Utah basic	\$22.00 to \$24.00
*Utah fdy., sil. 2.75 to 3.25	22.00 to 24.00
**Indian fdy., sil. 2.75 to 3.25	22.00 to 24.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

structural awards were 450 tons for an addition to the Bank of Italy, San Francisco, booked by Judson-Pacific Co., and 473 tons for a subway in Tucson, Ariz., the general contract for which was secured by R. H. Martin, Tucson. Plain material ranges from 2.15c. to 2.25c., c.i.f.

Cast Iron Pipe.—Although only two awards in excess of 100 tons were reported, a good-sized tonnage is pending. Besides the tonnage mentioned above, booked by C. G. Clausen & Co., J. J. Ongaro, Jr., Fairfax, took 122 tons of 2 and 4-in. pipe for Cloverdale, Cal. Whittier, Cal., rejected bids on 226 tons of 30-in. pipe. R. E. Hazard was low bidder on 301

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.60c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off.
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.40c.
Black sheets (No. 24)	4.35c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.00c.
Struc. rivets, 1/2-in. and larger	5.00c.
Com. wire nails, base per keg	3.35c.
Cement c't'd nails, 100 lb. keg	3.35c.

tons of 4 to 8-in. pipe for San Diego. Bids were opened on 783 tons of 6 to 12-in. pipe for Glendale, Cal. New inquiries include 436 tons of 16-in. pipe

for Beverly Hills, Cal., bids on which will be opened Sept. 8, and 189 tons of 2 to 8-in. pipe for San Diego, on which bids will be opened Sept. 2.

reduced rate of the past several weeks. Nearly all those having coke under contract are behind with specifications. Shipments outside the district are light. The price remains at \$5 a net ton, Birmingham.

BIRMINGHAM Bars, Shapes and Plates Revised Downward \$1 a Ton

BIRMINGHAM, Aug. 19.—Despite a gain in pig iron shipments, a slight drop in orders is reported as compared with the July rate. Extreme caution is still characteristic of buyers, and instructions for rush shipments still accompany orders. Hopes for enough improvement in the melt this quarter to bring shipments up to the output are waning. District sales continue to take the \$14 base price regardless of the reported concessions amounting to as much as \$2 in some competitive territories. Active furnaces total 14, the same as for the past three weeks. Of this number, nine are on foundry iron, four on basic iron and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.....	\$14.00
No. 1 fdy., 2.25 to 2.75 sil.....	14.50
Basic	14.00

Finished Steel—The past week has brought little change in the finished steel situation. Sales are averaging as well as last month. There has been a temporary loss in potential sales owing to excessive heat and drought. Sales executives anticipate increased demand, especially for sheets and wire products, with the coming of more favorable weather conditions. Railroads are behind with their specifications and are issuing no new inquiries. In other lines, where forward contracting is not common, mills are able to maintain operations on current orders. In order to bring prices in line with those elsewhere, quotations on bars, plates and shapes have been reduced \$1 a ton to a minimum of 1.85c. The price range on galvanized sheets has been dropped, and only the former minimum of 3.25c is now quoted. Thirteen open-hearthers are active and 10 are idle, the same as for the past three weeks.

Structural steel fabricators report a tendency on part of owners to close pending work. The Birmingham plant of the Virginia Bridge & Iron Co. will fabricate a portion of the 3000-ton order for pier caissons for the Lehigh Valley warehouse in New York. New orders of the Ingalls Iron Works include 1150 tons for a bank building at Atlanta, Ga., and 150 tons for an airplane hangar at Meridian, Miss. Reinforcing bar awards have been light, though a few good projects are being figured, with hopes of closing this week.

Cast Iron Pipe—Estimates recently made show that approximately 4000 tons of pipe will be required for the project to be awarded at Kenner, La.,

on Aug. 20. Another new project calls for about four miles of 8 and 12-in. pipe to be awarded by Hollywood, Fla., on Aug. 27. Tonnages are pending from Texas and Pacific Coast points. The National Cast Iron Pipe Co. has received contract for the 450 tons at Nashville, Tenn., for which it was reported low bidder last week. Utilities continue to buy in small scattered lots. Plants are maintaining unchanged operations, ranging from 50 to 65 per cent of capacity. Prices are holding well at \$37 to \$38 a ton, base Birmingham.

Coke—Buying is at a minimum, but shipments continue steady at the

Old Material—Releases of steel scrap to mills are spotty, with a light aggregate tonnage. Most of these are small lot shipments of special grades for supplementing mill stocks. Dealers report only occasional calls for cast iron grades. No changes are reported in the tentative price list which largely represents nominal values.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$12.00
Scrap steel rails.....	\$12.50 to 13.00
Short shoveling turnings..	9.00
Cast iron borings.....	9.00
Stove plate	11.50 to 12.00
Steel axles	20.00
Iron axles	23.00
No. 1 railroad wrought... 10.00 to \$	10.50
Rails for rolling	14.50
No. 1 cast	13.00
Tramcar wheels.....	12.50
Cast iron carwheels.....	13.00 to 13.50
Cast iron borings, chem....	13.50 to 14.00

BOSTON Buying of Pig Iron Declines—Structural Awards Improve—Scrap Prices Hold

BOSTON, Aug. 19.—The expectation that some fresh buying of pig iron was to develop found little reflection in actual tonnage placed during the past week. Of course, expectations were based partly on the conversational inquiries that were coming to hand, leading some furnace representatives to believe that needs were actual in many instances, but this is hardly so. As a matter of fact, leading consumers appear to be well stocked for some time. One of the bright spots in the situation that has developed in the past fortnight,

however, is that consumers are taking contract iron in better fashion, doing away with the requests to defer shipments from time to time. This is perhaps an indication that melt is better, that a little more cheerfulness is at hand and that prospects may eventuate in something better next month. Against more than 4000 tons of iron contracted for in the previous week, the total tonnage sold last week was only 1050 tons, with Mystic Iron Works getting more than a third. The rest was pretty well distributed among the Buffalo furnaces.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes.....	3.265c.
Plats, hot-rolled.....	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....*	3.55c. to 5.55c.
Squares and flats.....*	4.05c. to 7.05c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.
Per Cent Off List	
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts.....	50 and 5
Cold-punched nuts.....	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25..	\$20.28
†Buffalo, sil. 2.25 to 2.75..	\$20.28 to 20.78
*Buffalo, sil. 1.75 to 2.25..	20.91
*Buffalo, sil. 2.25 to 2.75..	20.91 to 21.41
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	22.61
*Ala., sil. 2.25 to 2.75.....	23.11
†Ala., sil. 1.75 to 2.25.....	18.75
†Ala., sil. 2.25 to 2.75.....	19.25

Freight rates: \$4.91 all rail and \$4.28 rail and water from Buffalo; \$5.21 all rail from Virginia; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

*All rail rate.
†Rail and water rate.

Structural Steel—There appear to be decidedly better prospects ahead in structural lines and, according to some leading interests, enough projects are being figured or talked about to hold out promise of favorable developments next month. In fact, the past week turned out to be quite active, with more than 4000 tons awarded. The largest job was 2100 tons for four bascule bridges for the Boston & Maine Railroad, awarded to

the Phoenix Bridge Co. The New England Structural Steel Co. was awarded 1400 tons for the Harvard University Unit No. 3, a dormitory structure, while the Bethlehem Steel Co. received the contract for 230 tons to go into the reconstruction of the L Street bridge, connecting Boston and South Boston, recently destroyed by fire, while the Eastern Bridge & Construction Co. of Worcester was awarded the 225 tons for the addition to the Children's Hospital in this city.

Reinforcing Steel.—The past week was of little importance in concrete bars. Approximately 200 tons, divided into eight or 10 small requirements, comprised the week's demand. There are three or four fairly good tonnages ahead, but how soon these will be put through is a question. The building program at Harvard University calls for 800 tons more of bars, 200 of which will go into a dormitory and 600 will be needed for the biological laboratory. These awards are looked for directly. Prices remain unsatisfactory, resulting from the keen competition that exists.

Old Material.—For the fourth successive week, prices on scrap have held without change. This has occurred through a period of rather quiet business, but on whatever has come to hand buyers have had to pay listed prices. Thus, it is believed bottom has been struck in the price range. Appearance of fair orders would unquestionably bring strength. A tonnage for Japan, which will consist largely of rails and other heavy scrap, will not leave here until late in the month and buying for this has been going on in a small and careful way. Supplies in the hands of dealers are generally light.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.	\$8.50 to \$9.00
Scrap T rails	8.25 to 9.10
Scrap girder rails	7.50 to 8.10
No. 1 railroad wrought	7.00 to 7.50
Machine shop turnings	4.00 to 4.35
Cast iron borings (steel works and rolling mill)	4.00 to 4.35
Bundled skeleton, long	6.00 to 6.75
Forge flashings	7.25 to 7.60
Blast furnace borings and turnings	3.10 to 4.10
Forge scrap	6.10 to 6.50
Shafting	13.00 to 14.50
Steel car axles	16.00 to 17.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	6.50 to 7.10
Rails for rolling	9.00 to 9.25
Cast iron borings, chemical	9.00 to 9.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	\$11.50 to \$12.00
No. 1 machinery cast	13.50 to 14.00
No. 2 machinery cast	11.00 to 11.50
Stove plate	8.50 to 9.50
Railroad malleable	16.00 to 16.25

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.15c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.60c.
Bands	3.50c.
Hoops	3.90c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	\$3.20
Black wire, base per 100 lb.	3.50

BUFFALO Steel Mill Operations Unchanged—Scrap Market Still Dull—General Electric Buys Pig Iron

BUFFALO, Aug. 19.—The General Electric Co. has bought about 1800 tons of foundry pig iron. Considerable of this purchase came to Buffalo furnaces. Miscellaneous bookings in small lots by local producers during the past week totaled about 3000 tons. The district price is firm at \$18.50, and the going price in New England is \$16 for No. 2 plain. Three or four 500-ton inquiries are reported from the East. Considerable Southern iron is reported going into New Jersey and New England at a delivered price of about \$18.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	\$18.50
No. 2X fdy., sil. 2.25 to 2.75	19.00
No. 1 fdy., sil. 2.75 to 3.25	20.00
Malleable, sil. up to 2.25	19.00
Basic	17.50
Lake Superior charcoal	27.28

Finished Steel.—Not much change is noted in the operation of Buffalo mills. The Lackawanna plant of the Bethlehem Steel Co. is operating 15 open-hearth of 24, a drop of one. The Donner plant of the Republic Steel Corporation is operating four. The Seneca Iron & Steel Co. is at about 50 per cent and Wickwire-Spencer is operating three open-hearth of four. There are no outstanding structural inquiries, but reinforcing bar makers are interested in the specifications for the proposed new market terminal which will require 600 to 700 tons of bars. A Buffalo fabricator received the contract for 450 tons of structural steel for a new school at La Salle, N. Y., and the structural work for the new market terminal, amounting to about 85 tons, was placed locally.

Old Material.—The better sentiment noted a week ago does not seem to

have developed into business. Barge shipments of No. 1 and No. 2 heavy melting stel from the East are increasing. Dealers buying against old orders of No. 1 and No. 2 steel report more difficulty in obtaining tonnages than heretofore, apparently because of a stiffening in the other districts. Blast furnaces appear to have covered for their scrap requirements. There is a general inactivity in the yards, most of which are practically closed.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	\$12.75 to \$13.25
No. 2 heavy melting scrap	11.00 to 11.50
Scrap rails	12.00 to 12.50
Hydraulic comp. sheets	11.25 to 12.25
Hand bundled sheets	9.00 to 9.50
Drop forge flashings	11.00 to 11.50
No. 1 busheling	11.25 to 12.50
Hvy. steel axle turnings	11.00 to 11.50
Machine shop turnings	6.00 to 7.00
No. 1 railroad wrought	10.00 to 10.50
Acid Open-Hearth Grades:	
Knuckles and couplers	15.00 to 15.50
Coil and leaf springs	15.00 to 15.50
Rolled steel wheels	15.00 to 15.50
Low phos. billet and bloom ends	16.50 to 17.00
Electric Furnace Grades:	
Short shov. steel turnings	9.75 to 10.25
Blast Furnace Grades:	
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
No. 2 busheling	7.00
Rolling Mill Grades:	
Steel car axles	16.00 to 16.50
Iron axles	19.00 to 19.50
Cupola Grades:	
No. 1 machinery cast	11.00 to 12.00
Stove plate	10.25 to 10.50
Locomotive grate bars	8.25 to 9.25
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Industrial	14.25 to 15.25
Railroad	14.25 to 15.25
Agricultural	14.25 to 15.25
Special Grades:	
Chemical borings	11.50 to 12.00

YOUNGSTOWN Trend of Steel Business Is Toward Improvement but Gains Are Small

YOUNGSTOWN, Aug. 18.—Careful perusal of order books and tonnage releases in the last few days by leading steel makers in this district indicates a slight increase in business. Although improvement is by no means general and various companies are affected in different ways, it is generally claimed that the steel industry is finally changing its trend. Releases from the automobile industry in the last two weeks have naturally shown an improvement over those of July, and this is reflected in expanding shipments of sheets, strip steel, bars and manufacturers' wire.

The Carnegie Steel Co. has been able to step up its production of bars a few points, and in the immediate Youngstown district this trend is generally reflected. In some cases, however, improvement here is made at the expense of continued inactivity of other plants belonging to a single

company. Releases for strips and sheets are coming principally from three or four automobile plants, especially Ford. Output of sheets is still well under 50 per cent, but it is indicated that this figure will be bettered before the end of the month. Likewise strip production may be expected to show some improvement.

Steel ingot activity in the Youngstown territory still rests heavily on the requirements of pipe mills. Production of line pipe is being pushed at all available plants, and plate mills are well occupied on production of skelp. Otherwise, demand for plates is considerably restricted, although fabricators of boilers and tanks have maintained a fair demand throughout the summer. The effects of the nationwide drought are not expected to be so keenly felt in this district as in others which depend more largely upon the buying power of farmers for

their business. Next season's demand for fencing, barbed wire and galvanized sheets is almost certain to be affected. The fabricators of steel building supplies in the Valley district may also be affected somewhat, but not directly. Manufacturers of office equipment are still running fairly well, and demand for steel furniture sheets, while restricted, is not so sharply affected as some other lines.

Steel prices are not being maintained as well as might be wished, and even though Valley mills refuse to recognize quotations of less than 2.45c. on black sheets, 3.10c. on galvanized, 2c. on light plates, and 2.15c. on blue annealed sheets, desirable business in all these products is frequently bringing out concessions. This is particularly true on light plates and blue annealed sheets, on which an open reduction seems imminent. On galvanized material, differentials of \$1 and \$2 to jobbers are being granted freely in some districts. Hot-rolled strip is holding in a general way at 1.65c. and 1.75c., Pittsburgh, while cold-rolled material is quotable at 2.35c. to 2.45c. Pittsburgh. The 1.65c., Pittsburgh, quotation on bars is being adhered to generally.

Wire nail prices remain weak, but quotations of less than \$2.05, Pittsburgh, are not heard in this district. Small buyers are still paying \$2.15. Plain wire is holding at 2.30c. The market on semi-finished steel is seldom tested, and nominal quotations remain unchanged at \$31, Youngstown, for billets, slabs and sheet bars.

No improvement is reported in the demand for pig iron, and stocks are accumulating in spite of the low rate of production of both merchant and steel-making stacks. The scrap market is strong, with dealers paying \$15 to \$15.50 to cover old orders for No. 1 heavy melting steel and hydraulic compressed sheets in some cases, and mills show little disposition to make further purchases. With less than half of the open-hearth furnaces in the district engaged, the consumption of scrap is naturally low, but the reduced melt is fairly well balanced by light production in this district, as well as in the Michigan area.

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
New billet reinf. bars.....	3.15c.
Rail steel reinf. bars.....	3.00c.
Hoops.....	3.90c.
Bands.....	3.35c.
Cold-fin. rounds and hex.....	3.80c.
Squares.....	4.30c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue ann'd sheets (No. 10).....	3.45c.
Structural rivets.....	4.20c.
Small rivets.....	.60 per cent off list
No. 9 ann'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg (25 kegs or more).....	2.95
Cement c'd nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.....	\$16.50
4-in.....	34.50
Seamless steel boiler tubes, 2-in.....	17.50
4-in.....	36.00

CINCINNATI Demand for Sheets Improves Slightly—Scrap Prices Firmer—Pig Iron Dull

CINCINNATI, Aug. 19.—Foundry activity in pig iron in this district is still confined to small spot shipments to cover immediate needs. Inquiries for substantial tonnages have practically disappeared, and for the past two weeks the trade has been without a sizable inquiry for pig iron. New bookings last week totaled about 2000 tons, of which about 300 tons was Southern iron, 200 tons was 7 to 8 per cent silvery and the remainder was Northern iron. The silvery is for shipment to northern Ohio. A central Ohio consumer bought 100 tons of Southern foundry iron and a Michigan buyer took 500 tons of Northern foundry. District furnace representatives, while still forecasting an uptrend next month, expect virtually no improvement during the remainder of this month.

Prices per gross ton, deliv'd Cincinnati:	
So. Ohio fdy., sil. 1.75 to 2.25.....	\$20.89 to \$21.39
Ala. fdy., sil. 1.75 to 2.25.....	15.69 to 16.69
Ala. fdy., sil. 2.25 to 2.75.....	16.19 to 17.19
Tenn. fdy., sil. 1.75 to 2.25.....	15.69 to 16.69
S'th'n Ohio silvery, 8 per cent.....	24.39

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Finished Steel.—District sheet mill operators indicate further slight improvement in the demand for steel sheets. As a result, production schedules have been increased to approx-

imately 45 per cent of capacity for the week, a gain of five points. The demand from the automotive field is still slow, although a slight improvement has also been noticed in this quarter. Current bookings are all for spot shipment.

Coke.—With the melt still low, the demand for foundry grades of coke is very light.

Old Material.—The scrap market is still quiet. Dealers are buying and selling carefully. Reports that awards on railroad lists last week were at good prices have tended to strengthen dealers' prices. In many instances, however, the smallness of dealers' bids has tended to freeze sources of supply.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$11.25 to \$11.75
Scrap rails for melting.....	11.75 to 12.25
Loose sheet clippings.....	7.75 to 8.25
Bundled sheets.....	9.75 to 10.25
Cast iron borings.....	7.75 to 8.25
Machine shop turnings.....	7.25 to 7.75
No. 1 busheling.....	9.50 to 10.00
No. 2 busheling.....	6.00 to 6.50
Rails for rolling.....	13.00 to 13.50
No. 1 locomotive tires.....	13.50 to 14.00
No. 2 railroad wrought.....	11.25 to 11.75
Short rails.....	17.00 to 17.50
Cast iron carwheels.....	12.00 to 12.50
No. 1 machinery cast.....	17.50 to 18.00
No. 1 railroad cast.....	14.50 to 15.00
Burnt plate.....	8.25 to 8.75
Stove plate.....	8.25 to 8.75
Brake shoes.....	8.25 to 8.75
Agricultural malleable.....	14.00 to 14.50
Railroad malleable.....	15.00 to 15.50

CANADA Iron and Steel Industry Operating at Less Than 50 Per Cent of Capacity

TORONTO, Aug. 19.—With the iron and steel industry of Canada operating at an average of less than 50 per cent capacity, raw material buying is correspondingly light. Merchant pig iron sales are at a low level, individual orders being chiefly for lots of one to two cars. Melters are carrying only small stocks of iron on hand, with the result that frequent orders are being placed for replacement needs. Comparing business with 1928, an official of the Algoma Steel Corporation said that sales for 1930 are about 25 per cent lower.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$22.60
No. 2 fdy., sil. 1.75 to 2.25.....	22.10
Malleable.....	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$24.00
No. 2 fdy., sil. 1.75 to 2.25.....	23.50
Malleable.....	24.00
Basic.....	22.50
Imported Iron, Montreal Warehouse	
Summerlee.....	\$33.50
Carron.....	33.00

Structural Steel.—Within the past week or two some improvement has developed in the demand for building steel. Municipal, provincial and federal governments are doing more construction work with the idea of relieving the unemployment situation

and, as a result, have been responsible for improvement in structural steel sales. Bridge construction work is the leading factor in the betterment at the present time. Some fairly substantial orders are pending for early closing.

Old Material.—Demand for iron and steel scrap is practically at a standstill. What business is coming to hand is restricted to small tonnages and most consumers are ordering on a hand-to-mouth basis. Mills continue to accept delivery against contracts and are placing small tonnages for spot delivery.

Dealers' buying prices for old material: Per Gross Ton

	Toronto	Montreal
Heavy melting steel.....	\$9.00	\$8.00
Rails, scrap.....	10.00	8.00
No. 1 wrought.....	9.00	11.00
Machine shop turnings.....	6.00	5.00
Boiler plate.....	7.00	6.50
Heavy axle turnings.....	7.00	6.00
Cast borings.....	6.50	5.00
Steel borings.....	6.50	6.00
Wrought pipe.....	4.00	4.00
Steel axles.....	10.00	13.00
Axles, wrought iron.....	12.00	15.00
No. 1 machinery cast.....	12.00	12.00
Stove plate.....	10.00	10.00
Standard carwheels.....	10.50	10.50
Malleable.....	9.00	10.00

Per Net Ton

No. 1 mach'y cast.....	11.00	....
Stove plate.....	9.00	....
Standard carwheels.....	10.00	....
Malleable scrap.....	9.00	....

Court Fixes Definition of Bundled Scrap

Decision in Long-Fought Baltimore Case Also Affects Rejected Cars and Validity of Dealer's Contract

IN a decision in the case of Simon Michlovitz, a Baltimore scrap dealer, against the Eastern Rolling Mill Co., Baltimore, involving a scrap contract and shipments of scrap, the Circuit Court of Maryland raised a question as to whether a penalty or reduction on rejected cars of scrap should be applied against the entire car or merely against that portion of the material not up to specifications.

In this particular phase of the case the amount of scrap involved was about 304 tons, of which only 65 tons, according to the testimony, was baled scrap, which the contract called for. The court allowed a \$2 a ton reduction on the remainder of the scrap, which he ruled consisted of "loose or unbundled scrap."

"It still remains for me," declared Judge Eugene O'Dunne in his decision, "to ascertain whether in the industry with which we are now dealing this \$2 a ton should be spread over the entire tonnage of the car, or whether it should be limited to the particular tonnage to which it is applicable. . . . I am disposed to be rather conservative on that and take the view that it should apply literally to the actual tonnage to which it is applicable and not to the entire tonnage in the car. My finding on the facts therefore will be limited in its application to the amount of tonnage which I find it to be applicable to, and that is the total weight of the total tonnage of 304 4-45 tons, less the 65 tons already referred to."

Defines Bundled Steel Scrap.

Judge O'Dunne made the following ruling as to what should constitute bundled or baled scrap:

I do not think that that which is merely rolled up in what is ordinarily termed a bundle can be said to be bundled in the sense of the wording of this contract. I also do not think that that which has once been bundled, but which is not bundled at the time of delivery, or which is not so bundled that it can be handled in ordinary shipments, in the ordinary manner of handling a commodity of that kind and keep its shape, can be said to have been "bundled."

The word "bundle" as applied to this scrap means bundled in such a manner and by such a method that it retains its bundle character under reasonable circumstances and in ordinary handling and finds its way into the market in a baled form. And that which is not so bundled as to do that is properly classified, in my judgment, as "unbaled, loose steel scrap," for which, according to the previous testimony, there is a difference in the market price of from \$2 to \$2.50 or \$3 a ton as against the "bundled" steel scrap.

Upholds Scrap Contract.

Another important issue was covered in this case when the court upheld the previous decisions that the Eastern Rolling Mill Co. had violated a contract made with the plaintiff, Simon Michlovitz, for the sale of its scrap over a period of five years. This contract, made in 1927, provided that the Eastern Rolling Mill Co. would sell to the plaintiff its bundled steel scrap and crop end scrap, the price to be fixed quarterly on the basis of trade paper quotations for the Philadelphia market, less an agreed differential. It was charged by Michlovitz that the Eastern Rolling Mill Co. had violated the contract by shipping its scrap to the Bethlehem Steel Co., from which, it appeared, it pur-

chased most of its semi-finished steel in the form of sheet bars. In the first hearing of the case in 1928 the Circuit Court of Baltimore held that the contract was equitable and ordered specific performance. This decision was fought in the Court of Appeals of Maryland, and in March, 1929, the Court of Appeals sustained the decision of the lower court.

Subsequently the officers of the Eastern Rolling Mill Co. were charged with contempt of court in view of the charge that they had delivered to the plaintiff carloads of loose, unbundled scrap instead of the bundled scrap which the contract called for. The recent decision was a result of this contempt proceedings, in which the court was asked to determine the damages to be awarded to Michlovitz on all cars of scrap not delivered according to specifications.

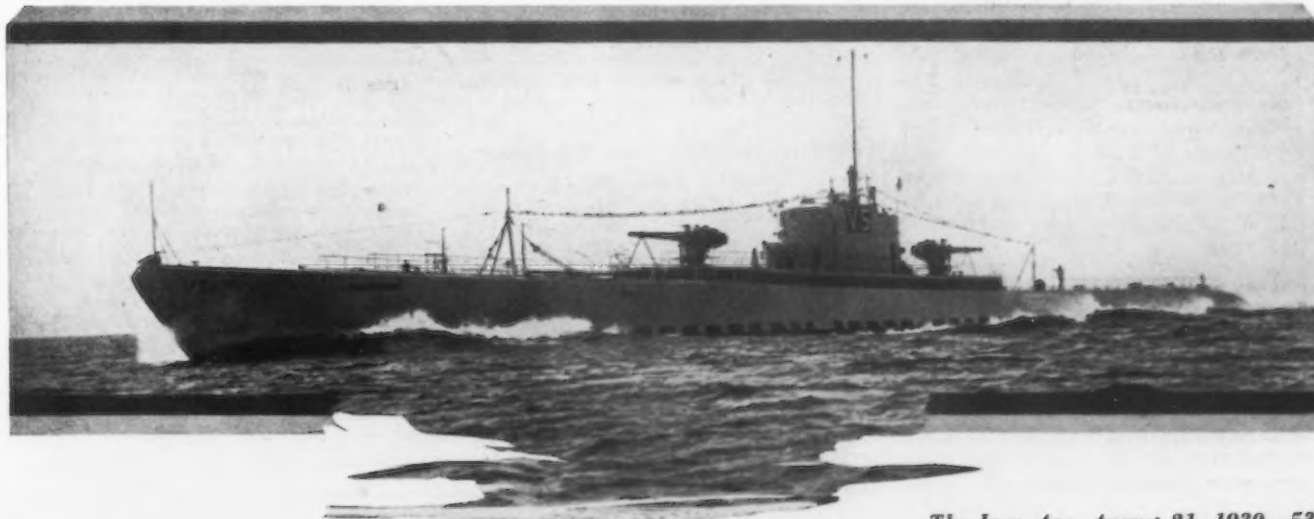
Court Comments on "Direct Dealing."

The Institute of Scrap Iron & Steel, Inc., which has been pursuing a vigorous campaign in opposition to "direct dealing" in scrap between steel mills and their customers, hailed the decision as an important argument for its case, especially that portion of the judge's decision which said:

"I do not think it is good policy to tie up the sale of your scrap with the steel company that you are buying your bars from. It seems to me the argument is perfectly idle to say that the sales should always be made direct from the Eastern Rolling Mill to Bethlehem Steel Co., and anybody with knowledge of the economic conditions of business would know that the minute the intermediary scrap man is eliminated from this market, and the Eastern Rolling Mill found themselves in the position of having to dispose of their scrap to Bethlehem Steel Co. they would expect business competition and dickers."

FIRST of the American cruiser-type fleet submarines, V5 is 371 ft. long and 33¼ ft. broad. Her weight is 2760 gross tons and ballast tanks of 1200 tons capacity give her a submerged displacement of 3960 tons. She was built at the Navy Yard

at Kittery, Me. With a crew of nine officers, nine petty officers and 70 men, her endurance range at sea is placed at 60 days, the cruising radius being 15,000 miles. The holes along water edge are for quickly freeing the ship of ballast water



Non-Ferrous Metal Markets

Copper and Tin Inactive— Lead Quiet, Steady— Zinc Stronger

NEW YORK, Aug. 19.

Copper.—A special sale of about 3000 tons of electrolytic copper on Aug. 14 at 10.75c., delivered in the Connecticut Valley, temporarily upset the market. Practically all of this went to one consumer, and it is quite generally believed that a custom smelter made the sale for the account of a primary producer. It is also stated that a carload or two was sold the other day at 10.62½c., delivered. These are the only sales heard of below the 11c. price which has prevailed for several weeks and which still persists. Demand is so light that a fair test of the market is lacking, but it is contended that now nothing can be bought under 11c., delivered. Sales abroad were temporarily held up because of the concessions referred to, but they are larger again. For the month to date they are estimated at 32,000,000 lb., which is a fair volume, but less than that of last month at this time. Producers are now selling some metal into November, but consumers are well covered and in some cases overbought. There has been no change in the price of Copper Exporters, Inc., which stands at 11.30c., c.i.f., usual European ports. Demand for Lake copper is light at 11c. to 11.12½c., delivered.

Tin.—A small business in nearby tin was done during the week, mostly by dealers. Consumers bought very little. Generally the market is inactive. The feature is the full price obtained in London on sales in the East amounting now to about £4 a ton over the future standard quotation. Stocks in London warehouses for the week ended Saturday, Aug. 16, were 24,879 tons, an increase of 306 tons for the week. Spot Straits tin was quoted today at 30.20c., New York. London quotations were little changed from those of a week ago, with spot standard at £135, future standard at £136 10s., and spot Straits at £136 7s. 6d. The Singapore price today was £140 10s.

Lead.—Quotations are firm and unchanged at 5.35c., St. Louis, and 5.50c., New York, but demand is not heavy, being confined mostly to the smaller users. Sales are not being made beyond September. Stocks of lead at American refineries on Aug. 1 were 62,880 tons, an increase of about 470 tons over those on July 1.

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Aug. 19	Aug. 18	Aug. 16	Aug. 15	Aug. 14	Aug. 13
Lake copper, New York.....	11.12½	11.12½	11.12½	11.12½	11.12½	11.12½
Electrolytic copper, N. Y.*.....	10.75	10.75	10.75	10.75	10.50	10.75
Straits tin, spot, N. Y.	30.20	30.00	....	29.75	29.75	29.75
Zinc, East St. Louis.....	4.40	4.40	4.40	4.40	4.30	4.30
Zinc, New York.....	4.75	4.75	4.75	4.75	4.65	4.65
Lead, East St. Louis.....	5.35	5.35	5.35	5.35	5.35	5.35
Lead, New York.....	5.50	5.50	5.50	5.50	5.50	5.50

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Zinc.—Due to the stronger attitude of producers, the price of prime Western zinc has advanced slightly and now stands at 4.40c., East St. Louis, or 4.75c., New York, for all positions through October. There is a little more desire on the part of producers to sell, but demand is not insistent. Sellers would hesitate to book orders at these levels beyond September. Ore is unchanged at \$32, Joplin, with sales for the week at 8420 tons. Shipments were 10,300 tons, leaving the surplus estimated at about 29,150 tons.

Antimony.—In a quiet market Chinese metal is quoted at 7.75c., New York, duty paid, with futures at 7.37½c. to 7.50c.

Nickel.—In wholesale lots, ingot nickel is quoted at 35c. a lb., with shot nickel at 36c., and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99

per cent pure, is obtainable at the published price of 22.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Aug. 19.—Volume of sales in this market continue to creep upward at a moderate pace. Prices for copper, after going to lower levels during the week, have regained their losses. Quotations on tin are weak.

Prices per lb., in carload lots: Lake copper, 11.125c. to 11.25c.; tin, 30.65c.; lead, 5.45c.; zinc, 4.50c.; in less-than-carload lots, antimony, 9c. —On old metals we quote copper wire, crucible shapes and copper clips, 9c.; copper bottoms, 7.25c. to 7.75c.; red brass, 7.25c. to 7.75c.; yellow brass, 5c. to 5.50c.; lead pipe, 4c.; zinc, 1.50c. to 1.75c.; pewter, No. 1, 15c.; tin-foil, 17.50c.; block tin, 22.50c.; aluminum, 7c. to 7.50c.; all being dealers' prices for less-than-carload lots.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass.....	17.75c.
Copper, hot rolled, base sizes.....	20.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes.....	23.00c.
Seamless Tubes—	
Brass.....	22.75c.
Copper.....	23.00c.
Brass Rods.....	16.12½c.
Brazed Brass Tubes.....	25.37½c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks.....	9.75c. to 10.25c.
Zinc sheets, open.....	10.75c. to 11.25c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig.....	32.50c. to 33.50c.
Tin, bar.....	34.50c. to 35.50c.
Copper, Lake.....	12.75c.
Copper, electrolytic.....	12.50c.
Copper, casting.....	12.25c.
Zinc, slab.....	6.25c. to 7.25c.
Lead, American pig.....	6.50c. to 7.00c.
Lead, bar.....	8.50c. to 9.00c.
Antimony, Asiatic.....	10.00c. to 10.50c.
Aluminum, No. 1 ingots for remelting (guaranteed over 99% pure).....	24.00c. to 25.00c.
Alum. ingots, No. 12 alloys.....	23.00c. to 24.00c.
Babbitt metal, commercial grade.....	25.00c. to 35.00c.
Solder, ½ and ¾.....	22.50c. to 23.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig.....	34.75c.
Tin, bar.....	36.75c.
Copper, Lake.....	12.25c.
Copper, electrolytic.....	12.25c.
Copper, casting.....	11.75c.
Zinc, slab.....	5.75c. to 6.00c.
Lead, American pig.....	6.25c. to 6.50c.
Lead, bar.....	8.75c.
Antimony, Asiatic.....	12.50c.
Babbitt metal, medium grade.....	17.50c.
Babbitt metal, high grade.....	38.00c.
Solder, ½ and ¾.....	21.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (Prices quoted are nominal. Holders of metal are generally unwilling to part with stock at present low levels.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	9.00c.	10.00c.
Copper, hvy. and wire	8.75c.	9.75c.
Copper, light and bottoms	7.50c.	8.50c.
Brass, heavy.....	5.00c.	6.25c.
Brass, light.....	4.50c.	5.75c.
Hvy. machine composition.....	7.75c.	8.75c.
No. 1 yel. brass turnings.....	5.50c.	6.50c.
No. 1 red brass or compos. turnings.....	7.00c.	8.00c.
Lead, heavy.....	4.25c.	4.75c.
Lead, tea.....	3.00c.	3.50c.
Zinc.....	2.25c.	2.75c.
Sheet aluminum.....	7.50c.	9.50c.
Cast aluminum.....	7.00c.	9.00c.

Fabricated Structural Steel

Bookings Slightly Less Than Week Ago—New Projects Include 8000-Ton Bridge and Subway

BOOKINGS of about 40,000 tons of fabricated steel were slightly smaller than in the previous week, but the total was in excess of the average for the year of 33,235 tons a week. Included in the larger awards were a total of 10,000 tons of structural steel in a New York warehouse for the Lehigh Valley Railroad, 5000 tons in an office building on Madison Avenue in New York, 5300 tons for an apartment building on East Fifty-second Street, New York, and 2300 tons in four bridges for the Boston & Maine Railroad.

New projects reached a total of 37,000 tons, or larger than the weekly average to date. Among the larger inquiries were 8000 tons for a bridge at Evansville, Ind., 6000 tons for a section of subway in Philadelphia, 2000 tons for a new United States Assay office in New York and 3000 tons for an apartment building on Central Park West, New York.

North Atlantic States

BOSTON & MAINE RAILROAD, 2300 tons, four bascule bridges, to Phoenix Bridge Co.

CAMBRIDGE, MASS., 1400 tons dormitory for Harvard University, to New England Structural Co.

BOSTON, 230 tons, reconstruction of L Street Bridge, to Bethlehem Steel Co.

BOSTON, 225 tons, addition to Children's Hospital, to Eastern Bridge & Construction Co.

NEW HAVEN, CONN., 1600 tons, quadrangle at Yale University, to Shoemaker Bridge Co.

NEW YORK, 5000 tons, building at 444 Madison Avenue for Gresham Realty Co., to Levering & Garrigues Co.

NEW YORK, 10,000 tons, warehouse for Lehigh Valley Railroad, Eleventh Avenue and Twenty-seventh Street, to Fort Pitt Bridge Works.

STATE OF NEW YORK, 200 tons, highway bridges, to American Bridge Co.

EASTVIEW, N. Y., 280 tons, jail and garage, to Just Structural Engineering Corporation.

NEW YORK CENTRAL RAILROAD, 200 tons, covering street openings in tunnel under Park Avenue, to American Bridge Co.

ERIE RAILROAD, 1000 tons, bridge to Phoenix Bridge Co.

LA SALLE, N. Y., 450 tons, school, to Buffalo Structural Steel Co.

PITTSBURGH, 300 tons, freight house for Baltimore & Ohio Railroad, to Pittsburgh Bridge & Iron Co.

PITTSBURGH, 165 tons, boiler house for Atlantic Refining Co., to Jones & Laughlin Steel Corporation.

PITTSBURGH, 100 tons, Beckwith Machinery Co., to Austin Co.

CONNELLSVILLE, PA., 140 tons, Capstan Glass Co., to Austin Co.

EVERETT, MASS., 115 tons, benzol building for Koppers Construction Co., to McClintic-Marshall Co.

PITTSBURGH, 150 tons, table frames for Schloemann Engineering Co., to Heyl & Patterson.

WEEHAWKEN, N. J., 4000 tons, pier D, to American Bridge Co. and Truscon Steel Co.

NEW YORK, 5290 tons, apartment building at Fifty-second Street and East River, to A. E. Norton.

YONKERS, N. Y., 1040 tons, office building, to Hinkle Iron Co.

The South

BATON ROUGE, LA., 118 tons, airplane hangar, to Southern Steel Works.

ATLANTA, GA., 1150 tons, Citizens & Southern Bank building, to Ingalls Iron Works.

MERIDIAN, MISS., 150 tons, airplane hangar, to Ingalls Iron Works.

Central States

CLEVELAND, 500 tons, Woodland Avenue bridge for Nickel Plate Railroad, to Bethlehem Steel Co.

SOUTH BEND, IND., 180 tons, Roach-Apleton Co., to Indiana Bridge Co.

SOUTH BEND, IND., 1245 tons, New York Central Railroad bridge, to American Bridge Co.

JOLIET, ILL., 230 tons, Boston Store, to Gage Structural Steel Co., Chicago.

CHICAGO, 250 tons, merchandise mart freight shed, to Vierling Steel Works.

ST. LOUIS, 300 tons, Pveley Dairy Co., to Atlas Iron Works, local.

Western States

WICHITA, KAN., 400 tons, subway, for Santa Fe Railroad, to Kansas City Structural Steel Co.

LOS ANGELES, 190 tons, Specification 2126, to Pacific Iron & Steel Co.

SANTA BARBARA, CAL., 250 tons, theater, to Consolidated Steel Corporation.

RIVERSIDE, CAL., 115 tons, bridge, to unnamed bidder.

SAN FRANCISCO, 450 tons, addition to Bank of Italy, to Judson-Pacific Co.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

CAMBRIDGE, MASS., unstated tonnage, Institute of Biology building at Harvard University.

NEW HAVEN, CONN., 700 tons, Sterling School of Medicine at Yale University.

NEW YORK, 3000 tons, 18-story apartment building at Ninety-second Street and Central Park West.

NEW YORK, 2000 tons, United States Assay Office building at Old Slip and South and Front Streets.

NEW YORK, unstated tonnage, building on West Eighty-third Street for Horn & Hardart Co.

NEW YORK, 100 tons, building at 693 Fifth Avenue for Richard Hudnut.

MAMARONECK, N. Y., 200 tons, junior high school.

TUXEDO PARK, N. Y., 150 tons, high school.

CATSKILL, N. Y., unstated tonnage, building for Cooperative Insurance Co.

WHITE PLAINS, N. Y., 100 tons, garage for Brownell Realty Co.

WILLIAMSON, N. Y., unstated tonnage, Central School building.

WEST CALDWELL, N. J., 100 tons, Mountain Ridge Country Club; formal inquiry not yet issued.

HAVERFORD, PA., unstated tonnage, athletic building for Haverford School.

PHILADELPHIA, 6000 tons, Market Street subway section; bids in Sept. 5.

BERGEN COUNTY, N. J., 1750 tons, nine highway bridges.

STATE OF MAINE, 615 tons, Richmond-Dresden Co., Kennebec River bridge.

STATE OF NEW YORK, 930 tons, highway bridges; bids to be taken Sept. 4.

OWENSDALE, PA., 400 tons, bridge for Pittsburgh & West Virginia Railroad.

Central States

MUSKOGON, MICH., 600 tons, Brunswick Radio Corporation.

COLUMBUS, OHIO, 2500 tons, State office building; bids to be taken Aug. 23.

EVANSVILLE, IND., 8000 tons, bridge.

CHICAGO, 1200 tons, Senn High School; Eggers-Schillo Co., low bidder.

CHICAGO, 1200 tons, extensions to platforms of elevated lines.

EVANSTON, ILL., 500 tons, Central Avenue subway for Milwaukee Road.

PEORIA, ILL., 400 tons, river and rail terminal dock building.

WATERTOWN, WIS., 200 tons, municipal bridge over Rock River; optional bids on reinforced concrete span.

LORAIN, OHIO, 125 tons, hospital.

AKRON, OHIO, 180 tons, building for Telling Belle-Vernon Co.

EAST ST. LOUIS, 650 tons, fertilizer plant for Darling & Co.

Western States

DENVER, 400 tons, junior high school.

TUCSON, ARIZ., 474 tons, Broadway subway; general contract to R. H. Martin.

ANACORTES, WASH., 1500 tons, plates, 20 to 24-in. steel pipe; bids Sept. 5.

SACRAMENTO, 100 tons, crossing in Humboldt County; bids opened.

The South

CORINTH, MISS., 200 tons, building for Corinth Hosiery Mills.

HUNTINGTON, W. VA., 1700 tons, mill buildings.

Non-Ferrous Ingot Unfilled Orders

CHICAGO, Aug. 14.—On Aug. 1, unfilled orders for brass and bronze ingots and billets on the books of the members of the Non-Ferrous Ingot Metal Institute amounted to 20,325 net tons.

Offices and warehouse of Patriarche & Bell, Inc., dealers in special spring and tool steels, have been moved from 351 West Street, New York, to 53 to 57 Carmine Street, where a new warehouse building, equipped with modern facilities for handling high-grade steels, has been erected.

Detroit Foundrymen's Association will hold its monthly meetings for the ensuing year on the third Thursday of each month, except August and December, at the Fort Shelby Hotel. James L. Mahon, American Car & Foundry Co., is president; W. J. Muhlthner, Great Lakes Foundry Sand Co., secretary. J. D. Stoddard, of the Detroit Testing Laboratory, is the representative of the American Foundrymen's Association.

Reinforcing Steel

Ford Plant at Richmond, Cal., Takes 2500 Tons

OF the 5700 tons of reinforcing steel awarded the past week, 3900 tons is for contracts on the Pacific Coast, of which 2500 tons will be used in a plant at Richmond, Cal., for the Ford Motor Co. New projects call for 2600 tons. The largest job, 700 tons, is a produce market terminal at Buffalo. Awards follow:

NEW YORK, 1250 tons, approach and vehicular tunnel on New York side of Hudson River bridge, to McClintic-Marshall Co.

FLINT, MICH., 135 tons, Post Office, to Olney J. Dean & Co.

BATTLE CREEK, MICH., 200 tons, Towers Building, to American System of Reinforcing.

SPRINGFIELD, ILL., 200 tons, highway work, to Olney J. Dean & Co.

SANTA BARBARA, CAL., 100 tons, theater, to an unnamed bidder.

LOS ANGELES, 420 tons, Sixth Street viaduct, to an unnamed bidder.

LOS ANGELES, 415 tons, Washington Street bridge, to an unnamed company.

SACRAMENTO, 227 tons, highway work in

San Diego County, to an unnamed company.

TUCSON, ARIZ., 277 tons, Broadway subway, to unnamed bidder.

RICHMOND, CAL., 2500 tons, Ford plant, to Soule Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BUFFALO, 700 tons, new produce market terminal.

CHICAGO, 150 tons, Senn High School.

CHICAGO, 200 tons, apartment building; Starrett Brothers, general contractor.

CHICAGO, tonnage being estimated, Illinois Central Randolph Street terminal.

CHICAGO, 230 tons, express building for Chicago & North Western.

CHICAGO, 300 tons, north approach to outer bridge.

SACRAMENTO, 100 tons, highway work in Los Angeles and Orange Counties; bids opened.

PASADENA, CAL., 300 tons, hotel addition; bids being taken.

LOS ANGELES, 150 tons, warehouse on Banning Street; bids being taken.

LOS ANGELES, 300 tons, apartment building, 470 North Rossmore Street; bids being taken.

LOS ANGELES, 200 tons, apartment building, Crescent Heights Boulevard; bids being taken.

tary of the Treasury suspend the liquidation of entries of manganese ore imported from Russia, pending an investigation "of the increment of additional duty properly chargeable against imports of such ore by virtue of the fact that such ore is freely offered and sold in the United States at less than its fair market value and at less than the indicated cost of production in Russia."

The complaint alleges that Russian manganese ore is being sold on the Atlantic seaboard at approximately 25c. per unit (22.4 lb.), or fully 15c. below the average for previous years. It is declared that the alleged dumping of Russian manganese ore upon the American market has compelled the major producers of manganese in the United States to close their plants and that the policy of Congress to establish a domestic manganese industry through tariff protection "is rapidly being defeated by the aggressive dumping campaign of the Soviet manganese ore trust."

Steel Merger Trial Enters Its Ninth Week

On Monday of this week, the suit to enjoin the Bethlehem-Youngstown Sheet & Tube merger, entered its ninth week and 27th day at Youngstown. It was halted for one week because of the death of Myron C. Wick, Jr., one of the original plaintiffs in the case, who died Aug. 8, following one week's illness of pneumonia. Mr. Wick's father, Myron C. Wick, Sr., was one of the pioneers in the development of steel tube manufacture. While not actively connected with the steel industry, Mr. Wick was nevertheless a heavy stockholder in several Youngstown independents. Three of the four executors of his estate, his bother, Philip Wick, his widow, Frances Todd Wick, and her brother, W. D. Todd, of New York, were conditionally authorized by the Common Pleas Court at Youngstown this week, to substitute as plaintiffs for Mr. Wick in the injunction suit.

Railroad Equipment

Illinois Steel Co. has ordered five 100-ton flat cars from American Car & Foundry Co.

Haley, Chisholm & Morris, Hinton, W. Va., have ordered 20 air dump cars from Koppel Industrial Car & Equipment Co.

American Smelting & Refining Co. is inquiring for 50 to 75 gondola cars.

National Railways of Mexico are inquiring for one to 10 2-6-6-2 type locomotives.

Rio Grande do Sul of Brazil is inquiring for 10 Garratt type locomotives.

Lehigh Valley has ordered one locomotive of 4-8-4 type from Baldwin Locomotive Works.

Chicago Great Western has ordered 15 freight locomotives from Baldwin Locomotive Works.

Government Offers States \$121,875,000 for Roads

WASHINGTON, Aug. 19.—The first specific result of the conference last week at the White House between President Hoover and State governors regarding plans for relief of drought sufferers was the announcement on Saturday by Secretary of Agriculture Hyde of allotments aggregating \$121,875,000 for the 48 states and Hawaii as the Federal Government's portion of road funds. The sum was made available immediately, having been advanced ahead of time so that the States, which are required to provide 50 per cent of the Federal totals, may proceed with work on highway construction as a means of relieving the unemployment situation, due partially to drought conditions.

Some States immediately responded and announced that work would be started at once. Of the total Federal allotment, about \$40,000,000 goes to the 13 states where drought conditions are extremely serious.

The allotments announced by Secretary Hyde follow:

Alabama, \$2,615,434; Mississippi, \$2,209,509; Missouri, \$3,957,287; Montana, \$2,580,405; Nebraska, \$2,644,726; Nevada, \$1,598,987; New Hampshire, \$609,375; New Jersey, \$1,565,749; New Mexico, \$1,984,363; Arizona, \$1,768,032; Arkansas, \$2,174,786; California, \$4,181,212; Colorado, \$2,315,948; Connecticut, \$792,359; Delaware, \$609,375; Florida, \$1,543,232; Georgia, \$3,316,029; Hawaii, \$609,375; Idaho, \$1,554,594; Illinois, \$5,150,396; Indiana, \$3,172,253; Iowa, \$3,330,593; Kansas, \$3,397,874; Kentucky, \$2,356,367; Louisiana, \$1,754,445; Maine, \$1,121,860; Maryland, \$1,051,714; Massachusetts,

\$1,813,916; Michigan, \$3,652,393; Minnesota, \$3,497,306; New York, \$6,002,475; North Carolina, \$2,871,722; North Dakota, \$2,001,841; Ohio, \$4,584,440; Oklahoma, \$2,922,569; Oregon, \$1,997,565; Pennsylvania, \$5,517,738; Rhode Island, \$609,375; South Carolina, \$1,769,848; South Dakota, \$2,054,077; Tennessee, \$2,687,123; Texas, \$7,620,239; Utah, \$1,416,493; Vermont, \$609,375; Virginia, \$2,379,788; Washington, \$1,940,922; West Virginia, \$1,324,680; Wisconsin, \$3,075,234; Wyoming, \$1,568,607.

Hearing Friday on Russian Manganese Dumping

WASHINGTON, Aug. 19.—Assistant Secretary of the Treasury Seymour Lowman has called a hearing for Friday of this week on the complaint of the American Manganese Producers' Association charging that Russian manganese ore is being dumped into the United States. The hearing will be held at the Bureau of Customs, of which F. X. A. Eble is chief, and will be open.

Mr. Lowman told THE IRON AGE that all interested parties have been invited to attend. It is understood that the iron and steel industry will be represented by a member of the American Iron and Steel Institute.

The Treasury has been making an investigation under the dumping complaint since it was filed on Aug. 11 and it was said that its inquiry probably will be completed within two or three weeks. The hearing is only one part of the inquiry and its duration is dependent upon the number who may appear to offer evidence on behalf of and in opposition to the charge.

The complaint asks that the Secre-

British Parties Confer on Unemployment

Conservatives Not Participating As Tariff Will Not Be Discussed

—German Unemployed With Families Reach 11 Per Cent

(By Cable)

LONDON, ENGLAND, Aug. 18.

WITH Great Britain still affected by the world-wide economic depression, political circles are suggesting imposition of a 10 per cent tariff on all imported manufactures.

The Liberal Party is conferring with the Government at the latter's invitation to consider measures for reducing unemployment, but the Conservative Party is abstaining because of the Government's refusal to permit discussion of tariff safeguarding of industry.

Iron and steel business continues dull, although the long Scottish holiday has ended. Cleveland pig iron has been reduced 4s. (97c.) per ton, but demand has not yet been stimulated, although foundry grades are at the lowest price since the end of the war. Hematite stocks are heavy, but quotations are unchanged despite price shading by merchants.

It is holiday week in Middlesbrough, but certain steel works propose to suspend for a fortnight and Formans have blown out seven more furnaces. In Scotland four more furnaces have been blown out and only eight are now in blast.

United Kingdom exports in July were 20,000 tons of pig iron of which the United States received none. Total iron and steel exports were 303,000 tons.

Continental steel business is quiet and although the new sales offices for semi-finished material and beams are nominally in operation, works are competing keenly for business.

Some friction has been caused in

**British May Impose General
10 Per Cent Duty on All
Imported Manufactures.**

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**Canadian Bridge Company
Buys 2500 Tons of Penstock
Steel in England.**

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**Turkish Government Places
70,000 Tons of Rails, 30
Locomotives and 1500 Cars
in Germany.**

* * *

**South African Plant to Pro-
duce Drill Steel Under Shef-
field Patents.**

* * *

**Australian Iron & Steel Cor-
poration to Be Equipped
with Continuous Sheet and
Strip Mills.**

the Continental Steel Cartel by Belgian exports of pig iron and rolled steel to Germany, contravening an unwritten understanding on mutual territorial protection. Official Belgian action has so far been ineffective in preventing this trade. Trouble has also been caused by deliveries to Germany of hoop iron by the Providence Works in France. This company, however, has now concluded a quota agreement with the German Hoop Iron Syndicate. Difficulties over the Cartel quota with the Providence Works in Belgium, which might have

led to that company seceding from the Cartel are now settled satisfactorily.

Tin plate stocks in Wales are the smallest for years and there is good demand for immediate delivery, which is not easy to satisfy. Mills have not been seriously inconvenienced by the general quietness of the market, but most are not producing their full quota. Such producers expect to be compensated by drawing a bonus from the association.

The Soviet Union is inquiring for tin plate, but business has been held up by difficulties in financing purchases. Galvanized sheet production has been drastically reduced and prices are steady. Black sheets are quiet and the Far East is not interested in buying.

The Tees Side Bridge Works has secured an order for steel framed hangars for the Cape to Cairo airplane service at Kisumu, Kenya and Broken Hill in North Rhodesia. The Dominion Bridge Co., Canada, now constructing penstocks for the Powell River Co.'s plant, has ordered 2500 tons of steel from Great Britain. This is said to be the first order ever placed in Great Britain for Canadian penstocks.

Skilled Sheffield steel workers are about to leave for South Africa to inaugurate production at the plant of the Pretoria Forge & Rolling Mills, Ltd., being erected at Pretoria adjacent to the South African Iron & Steel Corporation. The new plant will manufacture drill steel under the Bedford-Kendrick patents.

A new company formed in London with the name Simi Steel Products

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at \$4.8665 (par)

British Prices f.o.b. United Kingdom Ports

Ferromanganese, export. £11 10s.			\$55.95
Billets, open-hearth.... 5 17½	to £6 5s.		28.46 to \$30.41
Black sheets, Japanese specifications..... 12 5			59.61
Tin plate, per base box... 0 1½	to 0 18½		4.37 to 4.39
Steel bars, open-hearth... 7 15	to 8 5		1.69 to 1.79
Beams, open-hearth.... 7 7½	to 7 17½		1.60 to 1.71
Channels, open-hearth... 7 12½	to 8 12½		1.66 to 1.87
Angles, open-hearth.... 7 7½	to 7 17½		1.60 to 1.71
Black sheets, No. 24 gage 9 10	to 9 15		2.06 to 2.12
Galvanized sheets, No. 24 gage..... 11 17½			2.57

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2 16s.	to £3 0s.	\$13.62 to \$14.60
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Billets, Thomas.....	4 7		21.17
Wire rods, low C., No. 5 B.W.G.	6 2	to 6 4	29.69 to 30.19
Rails, light.....	6 0		29.20
Black sheets, No. 31 gage, Japanese.....	11 5	to 12 12	54.68 to 58.32
Steel bars, merchant....	4 8	to 4 10	0.98 to 0.99
Steel bars, deformed....	4 10	to 4 11	0.99 to 1.00
Beams, Thomas, British standard.....	4 18	to 5 0½	1.09 to 1.11
Channels, Thomas, American sections.....	5 12	to 5 14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick.....	4 8	to 4 9	0.98 to 0.99
Angles, Thomas, 3-in.	4 10	to 4 11	0.99 to 1.00
Hoop and strip steel over 6-in. base.....	5 0	to 5 2½	1.10 to 1.12
Wire, plain, No. 8 gage..	6 0	to 6 12½	1.32 to 1.46
Wire, barbed, 4-pt. No. 12 B.W.G.	10 0	to 11 0	2.21 to 2.42
Wire nails, base.....	6 2½	to 6 12½	\$1.35 to \$1.46 a keg

Corporation of Belgium will handle the products of certain Belgian steel works.

The German Stahlwerksverband is reported to have booked large contracts for steel placed by the U.S.S.R.

As a result of the recent agreement between the Turkish Government and certain German steel works, the Friedrich Krupp, A. G., has received an order for 70,000 tons of rails and 13 heavy locomotives, the Henschel company, 17 locomotives, while other orders to German industry include 1500 coaches and contracts for bridges, machine tools and brakes.

The Dutch boycott of German imports has been suspended as a result of the breakdown of the proposed German-Finnish commercial agreement, which is unpopular in Holland.

Russia Ships 47 Per Cent of Manganese Ore Imports

United States imports of manganese ore during the first six months of the current year, with the exception of the comparable period of 1926, were larger than for any first half year on record, according to the Minerals Division, Department of Commerce.

Total imports for the 1930 period amounted to 370,903 gross tons, representing an actual manganese content of 178,389 gross tons, in comparison with 342,959 tons, with an actual manganese content of 165,602 tons for the first six months of 1929, when consumptive demands of the steel industry, then operating near capacity, were considerably higher than at the present time. The current year's increase in United States imports, in the face of a stagnant world manganese market, is believed by the trade to be in fulfillment of contracts made in 1929.

Russia, Brazil, Gold Coast and India furnished approximately 98 per cent of the total imports during the period, with Russia holding the largest share of 47 per cent. Shipments from that source showed a gain of more than 20,000 tons over receipts for the same period of 1929. Russia has again reached the position of the world's leading producer and exporter of manganese ore, and during the fiscal year ended Sept. 30, 1929, set a new post-war production record of 1,256,788 metric tons.

Notwithstanding the Russian competition and internal economic conditions, Brazil's contribution to the United States' imports of manganese amounted to 107,700 tons, approximately 30 per cent of the total. This compared with 130,850 tons imported from that country during the first six months of 1929.

For the time being the Gold Coast has definitely replaced India as the third most important source of United States' receipts of manganese, and indications are that imports from this source will continue to mount so long as a favorable market exists. During the first six months of the current

year this section supplied 51,807 tons, or 14 per cent of total imports, compared with 5606 tons during the corresponding period of 1929.

British India continues to be an important factor in the United States import trade, although shipments from that source have continually declined since the re-entrance of the American market by Russian ores. Great Britain, France and Germany, however, continue to take large quantities of Indian ores. Total exports from India to all countries during 1929 were approximately 950,000 tons, a favorable increase over the preceding year, especially in view of the competition from other sources.

British Iron and Steel Output in July

LONDON, ENGLAND, Aug. 14 (*By Cable*).—Production of pig iron in the United Kingdom underwent another decline in July, but steel output increased. Output of pig iron was 486,100 gross tons, and steel ingots and castings, 621,400 tons. This year's monthly production in gross tons, is shown below.

	Pig Iron	Steel
July, 1930.....	486,100	621,400
June, 1930.....	563,200	600,100
May, 1930.....	614,500	692,800
April, 1930.....	619,600	696,100
March, 1930.....	665,800	826,100
February, 1930.....	597,000	776,400
January, 1930.....	650,000	771,100
Monthly average, 1929.	631,600	800,600

Soviet to Build 50-000-Ton Ferromanganese Plant

HAMBURG, GERMANY, Aug. 4.—The contract for a plant to produce ferromanganese at the Tchiatouri manganese mines in Georgia, recently closed by the Soviet Union with the Siemens & Halske A.G., calls for installation of electric furnaces with an initial capacity for 50,000 tons of ferromanganese annually. Eventually the capacity is to be increased to 150,000 tons a year, practically all of which will be used by the Soviet steel works. The plant will represent a total investment of about \$4,600,000.

The Soviet trade delegation now in Germany has placed large orders, including about 40,000 tons of sheets, plates and hoops.

German Steel Workers Seek 48-Hr. Week

DUSSELDORF, GERMANY, Aug. 5.—Trade unions in the Ruhr have refused to renew the present working agreement with the steel mills unless there is a general reduction of working hours to a maximum of 48 hr. a week, without a corresponding reduction in wages. The present working week ranges from 52 to 56 hr. The employers have refused to grant the reduction of working hours, and the question has been submitted to an arbitration court.

New Drill Steel Plant for South Africa

LONDON, ENGLAND, Aug. 6.—Drill steel is to be produced in the Transvaal by the Pretoria Forge & Rolling Mills, Ltd., under the patents of R. A. Bedford and Joseph Kendrick of Sheffield. A group of experienced Sheffield steel makers headed by the latter are leaving for South Africa for five years. Much of the drill steel being used now at the Witwatersrand is produced in Sheffield under the Bedford-Kendrick patents. The new Pretoria works will adjoin the plant of the South African Iron & Steel Industrial Corporation and is expected to produce about 450 tons of high-grade steel a month.

Continuous Sheet Mill for Australia

HAMBURG, GERMANY, Aug. 4.—German manufacturers of steel mill equipment are bidding on an inquiry from the Australian Iron & Steel Corporation, Mount Kembla, New South Wales, calling for a continuous sheet and strip mill with an ultimate capacity of 60,000 tons of sheets and strip steel annually. Bids are also being submitted by British builders of rolling mills.

Japan to Roll Bands and Strip Steel

YOKOHAMA, JAPAN, July 22.—The Government Steel Works at Yawata is considering adding to its line of steel products by rolling bands, strip steel and steel ribbons and may increase its output of black sheets and tin plate, a fair tonnage of which is still imported. In 1929 imports of black sheets reached 131,600 metric tons, of bands 41,670 tons and of ribbons 5000 tons.

Semi-Finished Sales Cartel May Fail

DUSSELDORF, GERMANY, Aug. 5.—Extent of the control over sales of semi-finished steel and beams, which will be exercised by the recently formed selling syndicate, seems to be very much in question. Although the steel cartel has established offices in Paris and at Seraing, Belgium, as had been announced, it appears now that sales of semi-finished material and beams will continue to be carried on directly by the mills. Each mill is expected to furnish to these offices a copy of all orders and the prices at which they sell will be regularly fixed by the cartel. As similar systems of selling have been established on this basis and failed through development of "quiet selling," which was not reported to the cartel, buyers are inclined to believe that the present arrangement on semi-finished material and beams will be unenforceable.

Machinery Markets and News of the Works

New Low for Tool Orders

Poor Business in July Carries Index Down Almost to Depression Point of 1925

ORDERS for machine tools in July were so poor that the index for all groups declined to 91.1 and the three months' average was carried down to 117.3, according to the monthly summary of the National Machine Tool Builders' Association. This is the lowest point the index has reached since March, 1925, following the depression of 1924. In the machine tool index, the figure 100 represents the average of monthly shipments in 1922, 1923 and 1924.

Shipments during July were also at a low point, being represented by a rating of 128.1, as compared with an average of 206 for the first six months of this year. The falling off in shipments is probably accounted for, in part at least, by the fact that many plants were shut down during a part of July.

Cancellations were not unusually heavy, but were slightly above those of July. The deferring of shipments, however, raised the ratio of unfilled orders to shipments to 1.8 times, compared with 1.6 times at the end of

June. The unfilled orders index is down to 235.3, as against 282.3 for June.

The extent of the decline in machine tool business from the peak of last year, in February, is shown by a comparison of 336 for that month as against the 91.1 for July.

Although current orders show no gain over the low rate of recent weeks, a few more inquiries have appeared, notably one for about \$125,000 worth of tools for the South Works of the Illinois Steel Co., Chicago. The Chicago trade is also figuring on a small list of shop equipment for the A. O. Smith Corporation, Milwaukee, and a number of items for the Majestic Household Utilities Corporation, Chicago. In the East, an inquiry for several tools has come from the American Locomotive Co.

Orders have been accepted by a number of machine tool companies from the Amtorg Trading Corporation for shipment to the new tractor plant in Soviet Russia.

New York

NEW YORK, Aug. 19.—The American Locomotive Co., New York, is inquiring for several machines for its Schenectady, N. Y., plant and for its subsidiary, the McIntosh & Seymour Corporation, Auburn, N. Y. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., whose purchasing office is in New York, is inquiring for one or two machines. An inquiry the size of that issued by the American Locomotive Co. has been rare during the summer lull of the past two months. As a general thing, inquiries are extremely few, but there is a good deal of business that has been pending for several months, on which orders are expected as soon as the business situation is such as to encourage manufacturers to go ahead with their plans.

Officials of Air Reduction Co., Inc.,

60 East Forty-second Street, New York, manufacturer of commercial oxygen, acetylene welding apparatus, etc., have organized Magnolia Airco Gas Products Co., a subsidiary, to operate primarily in Texas. New organization will take over and expand Magnolia Gas Products Co., with commercial oxygen plants at Houston, Beaumont and San Antonio, Tex., and acetylene plants at first-noted place.

Westchester Lighting Co., Mount Vernon, N. Y., has superstructure under way for a new four-story and basement equipment storage and distributing plant at Pleasantville, N. Y., with automobile service, repair and garage facilities for company trucks and cars, to cost over \$115,000 with equipment. General contract recently was let to Cuzzi Brothers, 10 Second Avenue, Mount Vernon.

In connection with removal of plant from 11 Wilbur Avenue, Long Island City, to Toledo, Ohio, Moto-Meter Gauge & Equipment Corporation, manufacturer of ammeters, gages and other automobile equipment, has purchased Toledo Litho-

graphing & Etching Co., Toledo, manufacturer of etched metal specialties, etc., and will consolidate with organization in that city. Main plant will be located at present factory of W. G. Nagel Electric Co., 511 Hamilton Street, Toledo, an affiliated company.

Conveying and mechanical-handling equipment, power and general operating machinery will be installed in fourteen-story addition to printing plant on West Forty-third Street, New York, to be erected by New York Times, to cost about \$1,500,000 with machinery. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Corn Products Refining Co., 17 Battery Place, New York, is contemplating expansion at grinding and refining plant at North Kansas City, Mo., including installation of elevating, conveying, screening, grinding and other equipment. Extensions will also be made in steam power station. Entire project will cost over \$2,000,000 with machinery.

Radio Corporation of America, Inc., Woolworth Building, New York, has plans for an addition to broadcasting station at Bound Brook, N. J., including installation of power and electrical equipment, to cost over \$100,000. Clinton MacKenzie, 119 Broad Street, New York, is architect.

Real estate, plant and equipment of Sonora Phonograph Co., 233 Broadway, New York, at Saginaw, Mich., covering two blocks, with machinery and fixtures for manufacture of talking machines and radios, will be offered at a public sale on Sept. 3 and 4. Plant is said to represent an investment of about \$1,000,000, and will be sold as a result of bankruptcy proceedings. Another plant of company at Buffalo is not included in sale.

Foster-Wheeler Corporation, Carteret, N. J., manufacturer of steam condensers, cooling towers, evaporators and other steam power equipment, is erecting a one-story addition, 75 x 300 ft., to cost over \$50,000 with equipment, for production of metal and wood patterns and other products.

Aluminum, Brass & Copper Works, Inc., Newark, care of William H. Parry, 9 Clinton Street, attorney, recently organized with a capital of \$100,000, plans operation of local factory for manufacture of metal goods, including plumbing specialties. Company is headed by William J. and Walter W. Filipowicz.

Board of Education, 417 South Broad Street, Elizabeth, N. J., is considering construction of a new vocational school for boys, to cost over \$150,000 with equipment.

National Air Transport, Inc., 420 Lexington Avenue, New York, has plans for a new hangar with repair and reconditioning facilities at Newark Airport, to cost about \$50,000 with equipment, and will begin work in September. Company will transfer its operating base from Hadley Field, near New Brunswick, N. J., to new location.

Jersey Central Power & Light Co., Asbury Park, N. J., will issue preferred

stock in amount of \$650,000, and common stock totaling \$100,000, part of proceeds to be used for extensions and improvements in plants and system.

Standard Underground Cable Co., DeKalb Avenue and High Street, Perth Amboy, N. J., has superstructure under way for two additions, one and two stories, to cost over \$100,000 with equipment.

William Johnson, Inc., Brenner and Kent Streets, Newark, N. J., manufacturer of mechanics' tools and hardware specialties, has been incorporated with Arthur Johnson as president. Business has been conducted as a partnership since it was established by William Johnson in 1830.

Combustion Engineering Co., New York, has received contract from Brooklyn Edison Co. for eight boilers and accessories, including water-cooled furnaces, economizers, boiler settings and steel work for installation in Hudson Avenue generating station. Contract amounts to more than \$2,000,000.

New England

BOSTON, Aug. 18.—New England Telephone & Telegraph Co. is contemplating erection of a new warehouse and supply depot for the New England territory at Watertown, Mass. Part of plant will be devoted to a repair shop. Structure will be occupied mainly by Western Electric Co. which will move from present quarters in South Boston, when new building is completed. Construction will start early in fall.

Terry Steam Turbine Co., Windsor Street, Hartford, Conn., manufacturer of turbine engines, etc., has awarded general contract to Bartlett-Brainard Co., 252 Asylum Street, for a one-story addition, to cost over \$30,000 with equipment.

A. H. Hews & Co., Inc., Cambridge, Mass., manufacturer of flower pots and kindred products, is considering rebuilding part of plant destroyed by fire Aug. 15.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids, no closing date stated, for equipment for power plant at naval fuel depot at Melville, R. I., including boilers, oil burners, motor-driven pumps, surface condensers, oil tanks, etc.

Dayton Airplane Engine Co., Dayton, Ohio, is arranging for removal of plant to new works at Pawtucket, R. I., secured in connection with purchase a few months ago of Eastern Aircraft Corporation, Pawtucket, organized to manufacture all-metal aircraft of monoplane type from German designs, and which line will be continued by the Dayton company at its new location. Last noted company has concluded merger with Pheasant Aircraft Corporation, Fond du Lac, Wis., and this plant also will be transferred to Pawtucket, where all production will be concentrated. Increased capacity will be carried out both for aircraft engine and airplane manufacture. George Funkhouser, president of Dayton company, will be chairman of board of consolidated organization, and Capt. R. J. Goodman-Crouch, president; Harold Bolas is vice-president and engineer.

Metal Craft Co., New Haven, Conn., care of C. K. White, Hamden, Conn., recently formed by Mr. White and associates with capital of \$50,000, plans operation of factory at New Haven for manufacture of line of metal goods.

Gulf Refining Co., 31 St. James Avenue, Boston, is arranging for expansion and improvements at oil storage and distributing plant at Beverly, including main one-story storage and distributing unit, 80 x 280 ft., and two-story structure adjoining, 36 x 52 ft., one floor of which will be equipped as a machine shop. Other improvements will be made, including installation of tanks, pumping equipment, etc. Entire project will cost about \$100,000. Main offices are in Frick Annex, Pittsburgh.

Brown Co., Inc., Berlin, N. H., operating a pulp and paper mill, plans rebuilding part of pulp department recently destroyed by fire, with loss over \$300,000 including machinery.

Philadelphia

PHILADELPHIA, Aug. 18.—A lease has been arranged by City Council, Philadelphia, for ratification by Aviation Corporation, 122 East Fortieth Street, New York, for 22 acres at Hog Island, to be used by last noted company for new plant for manufacture of seaplanes and flying boats, including parts production and assembling. Work on new plant is expected to start soon, comprising main one-story units with total of about 50,000 sq. ft. floor space, to cost over \$200,000 with machinery. City Council will also arrange another lease for 50 acres at same location with Dornier Co. of America, Inc., General Motors Building, New York, an interest of General Motors Co., for plant for manufacture of giant type flying boats and other aircraft, to cost over \$350,000 with machinery.

Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has filed plans for a coal storage and distributing plant, to cost about \$50,000. General contract has been let to Nicholson Co., 405 Lexington Avenue, New York.

American Fork & Hoe Co., 4001 Ashland Avenue, Philadelphia, has arranged for removal of local export works to plant at Ashtabula, Ohio, where all export business will be concentrated. Main offices of company are in Keith Building, Cleveland.

Continental Can Co., 1 Pershing Square, New York, will call for bids on general contract about middle of September for new five to seven-story can-manufacturing plant at Camden, N. J., 129 x 339 ft., output to be used primarily for requirements of Campbell Soup Co., to cost about \$1,000,000 with equipment. Francisco & Jacobus, 511 Fifth Avenue, New York, are architects and engineers.

Ovens, power equipment, conveying machinery and other mechanical-handling equipment will be installed in the new one-story plant, 30 x 280 ft., to be erected by Freihofer Baking Co., Twentieth Street and Indiana Avenue, Philadelphia, to cost over \$80,000. C. B. Comstock, 122 East Forty-second Street, New York, is architect and engineer.

State Department of Institutions and Agencies, State House, Trenton, N. J., will soon begin construction of two and three-story power plant, 67 x 90 ft., at State village for epileptics, Skillman, to cost over \$85,000 with equipment. Division of Architecture and Construction, State Office Building, is architect and engineer.

H. & H. Commercial Body Corporation, West Point, Pa., recently formed by Wilmer R. Hangey, 214 South Fourth Street, North Wales, Pa., and associates,

with capital of \$50,000, will operate local plant for manufacture of automobile bodies. W. A. Harwick, 124 Washington Avenue, North Wales, will be one of heads of company; Mr. Hangey will be treasurer.

South Atlantic

BALTIMORE, Aug. 18.—Crown Cork & Seal Co., Baltimore, manufacturer of bottle caps, bottle-capping machinery, etc., is arranging for early consolidation of two local plants in one main operating unit at Highlandtown, where one of present factories is located. Expansion will be carried out with consolidation.

General Motors Truck Corporation, Pontiac, Mich., is arranging for early occupancy of building at Charlotte, N. C., now in course of erection, recently leased for a new factory branch, repair and service plant, one story, 105 x 200 ft., to cost over \$85,000 with equipment.

James W. Kendler & Sons, Inc., Richmond, Va., recently organized by James W. Kendler, 713 West Main Street, and associates, is planning operation of local factory for production of sheet metal products.

Board of Directors, Maryland Training School for Boys, Loch Raven, Md., has awarded general contract to Davis Construction Co., 9 West Chase Street, Baltimore, for a two-story vocational school addition, 130 x 192 ft., to cost over \$180,000 with equipment. H. P. Hopkins, 347 North Charles Street, Baltimore, is architect.

Eastern Cotton Oil Co., Board of Trade Building, Norfolk, Va., has purchased about 20 acres near Cape Fear, Wilmington, N. C., as site for a new cottonseed oil manufacturing plant, to cost over \$60,000 with machinery.

United States Coast Guard Headquarters, Washington, is asking bids until Sept. 1 for a quantity of four-conductor submarine cable.

South Carolina Public Service Co., Charleston, S. C., is planning extensions and improvements in artificial gas plant and system, including installation of new equipment, to cost over \$150,000. Company is a subsidiary of Central Public Service Corporation, 105 West Adams Street, Chicago.

Smith-Douglass Fertilizer Co., Norfolk, Va., is planning erection of new works at Kinston, N. C., where site was recently acquired, for production of commercial fertilizers, to cost about \$55,000 with machinery.

Board of Education, Winston-Salem, N. C., is considering installation of manual training equipment in new three-story and basement high school to cost about \$500,000, for which bids will soon be asked on general contract. Harold Macklin, Realty Building, is architect. Walter R. McCornack, Buckley Building, Cleveland, is associate architect.

General Purchasing Officer, Panama Canal, Washington, is asking bids until Sept. 5 for Diesel engines.

Board of Works, Baltimore, will expend about \$3,000,000 for new municipal airport near Chesapeake Bay, about 10 miles from city, now under way. Field will include about 380 acres reclaimed from a salt water creek. Project will include hangars, repair shops and other field units, with facilities for seaplanes and flying boats.

State Board of Education, Richmond, Va., has plans for a three-story and basement State industrial school and

college at Petersburg, Va., to cost over \$800,000 with equipment. Walter R. McCornack, Buckley Building, Cleveland, is architect.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids, no closing date stated, for watertube boilers, superheaters, oil pumping machinery, oil burning equipment, etc., for naval air station, Pensacola, Fla.

Buffalo

BUFFALO, Aug. 18.—Madison Wire Co., 550 Abbott Road, Buffalo, manufacturer of general wire goods, has begun erection of new plant totaling about 20,000 sq. ft. floor space, to cost about \$65,000. Present works will be removed to new location and additional equipment provided for increased output.

Board of Education, Niagara Falls, N. Y., has disposed of a bond issue of \$1,500,000, fund to be used for erection of two new junior high schools, for which bids have been asked on general contract. Manual training departments are planned in each unit.

International Nu-Tip Tool Corporation, Oswego, N. Y., recently chartered with a capital of \$382,500, has purchased plant and business of Oswego Tool Co., Inc., and will take early possession. New company will manufacture tools, specialties and automotive equipment. Benjamin E. Shove, Camillus, N. Y., is president.

Industrial Plants Corporation, auctioneer, 25 Church Street, New York, will sell at public auction, Aug. 26, all land, building, machinery and equipment of Syracuse Perfection Castings, Inc., successor to Smith Wheel, Inc., Erie Boulevard and Geddes Street, Syracuse, N. Y.

Cleveland

CLEVELAND, Aug. 18.—No improvement is apparent in the machinery market and the August volume of business is expected to be about the same as that in July. Sales are limited to single items and are not numerous. While dealers see no change for the better, some machine tool manufacturers report a gain in inquiry for single tools from scattered sources outside of the automotive field. A moderate trend upward in orders is looked for in September.

United States Steel Grave Vault Co., Gallon, Ohio, has awarded general contract to Austin Co., Cleveland, for new unit, to cost close to \$100,000 with equipment.

B. F. Klein, president, Kayline Fixture Co., 600 Huron Road, Cleveland, has plans for a six-story automobile service, repair and garage building, 80 x 125 ft., to cost about \$250,000 with equipment.

Ohio Edison Co., Akron, Ohio, has plans for a steel tower transmission line from Toronto, Ohio, to Akron, of double-circuit type, with two sets of towers, totaling 700 such units in all, to cost about \$3,000,000. Allied Engineers, Inc., Youngstown, is engineer.

American Steel & Wire Co., Rockefeller Building, Cleveland, has awarded general contract to Stevens Construction Co., Erie Building, for one-story addition, to cost over \$200,000 with equipment.

Toledo Transportation Airport, Inc., Toledo, Ohio, recently organized, has leased hangar of Curtiss-Wright Flying

The Crane Market

THERE is a fair volume of new inquiry for overhead traveling cranes, but purchasing is still rather limited. In the Chicago district the Inland Steel Co. is in the market for a 5-ton overhead crane for handling billets. The Tennessee Coal, Iron & Railroad Co. is in the market for nine overhead cranes of various types. The A. O. Smith Corporation, Milwaukee, is inquiring for a 20-ton overhead crane with 5-ton auxiliary.

Recent purchases of overhead cranes have included 11 by the Jones & Laughlin Steel Corporation for its Aliquippa and South Side plants from the Cleveland Crane & Engineering Co., a 15-ton crane by the Keystone Steel & Wire Co., Peoria, Ill., from the Cleveland Crane & Engineering Co., a 5-ton electric crane by the Ingalls Stone Co., Bedford, Ind., and a 25-ton gantry crane for Hutchinson, Kan., purchased by the Santa Fe Railroad from the Whiting Corporation.

Service at municipal airport and will expand for air terminal, including additional hangar space, with repair facilities, etc., to cost about \$50,000.

State Department of Public Welfare, Columbus, Ohio, has awarded contract to G. H. Moehlman, Norwalk, Ohio, for general service, cold storage and baking plant at Cleveland, two stories and basement, 100 x 100 ft., to cost about \$160,000 with equipment. T. R. Ridley, Hartman Hotel Building, Columbus, is architect.

Chicago

CHICAGO, Aug. 18.—Several machine tool dealers report larger sales for the past week. As this situation is not general and inquiries remain light it cannot be taken that a definite turn for the better is at hand. Notable among requests for prices before the trade is about \$125,000 worth of machine tools for South works of the Illinois Steel Co., which also will buy a lathe, shaper and milling machine for its Joliet works. The A. O. Smith Corporation, Milwaukee, is interested in new machine shop equipment and Majestic Household Utilities, Chicago, is ready to close on a number of items.

Jobbing shops, which are finding orders somewhat more numerous, are beginning to look for miscellaneous equipment to round out shop facilities. An encouraging note comes from forge shops that are figuring on several new large inquiries which when placed will necessitate the purchase of equipment.

Chicago Surface Lines, 231 South La Salle Street, Chicago, will build an addition to car barns to cost \$100,000. Hugo Schmidt, 1155 North Clark Street, is architect.

Baker-Nagle Co., Freeburg Avenue, Belleville, Ill., manufacturer of iron and other metal castings, has awarded general contract to Bauer Brothers Construction Co., Belleville, for one-story foundry unit, 95 x 135 ft., to cost about \$40,000 with equipment. R. Z. Gill & Co., 1328 Walnut Avenue, Murphysboro, Ill., are architects.

McDonald Machine Co., 7600 South Racine Street, Chicago, a subsidiary of

Continental Can Co., 1 Pershing Square, New York, is establishing a new plant unit for repairing and rebuilding damaged or worn-out machinery used at plants of parent company. About 20,000 sq. ft. has been leased for new department. Storage and distributing facilities will also be provided for obsolete equipment to be disposed of.

Anderson Tool & Die Co., Albany and Ohio Streets, Chicago, has superstructure under way for a one-story machine shop, to cost about \$24,000 with equipment. C. E. Frazier, 64 West Randolph Street, is architect.

City Council, Cedar Falls, Iowa, is considering installation of a municipal ice-manufacturing plant, to cost over \$35,000 with machinery. Clark Streeter is city engineer, in charge.

Continental Oil Co., Continental Oil Building, Denver, has asked bids on general contract for initial units of new refinery on 100-acre tract near city, recently acquired, to consist of treating plant, Ethyl mixing plant, pumping station, storage and distributing buildings, to cost over \$200,000 with equipment. Company is contemplating refining unit with capacity of 2000 bbl. a day in near future. W. N. Haines is construction engineer.

Holt Motor Co., 1301 Hennepin Avenue, Minneapolis, has awarded general contract to E. M. Ganley Co., 2922 Oakland Avenue, for two-story and basement automobile service, repair and garage building, 155 x 158 ft., with foundations for four additional stories later, to cost about \$200,000 with equipment. Liebenberg & Kaplan, McKnight Building, are architects.

General Manganese Corporation, Mitchell, S. D., recently organized, has begun construction of a new reduction mill near Mitchell, where a large tract has been secured. Plant will have an initial capacity for handling about 50 tons of crude ore a day and will cost over \$150,000 with machinery.

Bureau of Standards, Master Scale Depot, 5800 West Sixty-ninth Street, Chicago (Clearing Station), is asking bids until Oct. 15 for master railroad scale testing equipment.

Cincinnati

CINCINNATI, Aug. 18.—Demand for machine tools in this district is at a low level and indications are that August will be the worst month of this year. It is believed, however, that an uptrend will set in next month. Inquiry has receded and the bulk of requests is for special machines. Production is noticeably below normal.

Local manufacturers have been receiving small orders from the Amtorg Trading Corporation, New York, for machines for Russian tractor plants; one manufacturer booked an order for six tools the past week.

Boye & Emmes Machine Tool Co., 2245 Spring Garden Avenue, Cincinnati, is receiving sketches from engineers and contractors for a new plant, to cost over \$50,000. Company is compelled to move from present location owing to a municipal terminal project.

Board of Education, Lancaster, Ohio, is considering installation of manual training facilities in addition to high school to cost about \$250,000, for which bids have been asked on general con-

tract. Vernon Redding & Associates, Mansfield, Ohio, are architects.

Standard Oil Co. of Louisiana, 2134 St. Charles Avenue, New Orleans, has plans for a branch storage and distributing plant at Memphis, Tenn., to cost about \$100,000 with equipment.

Tennessee Public Service Co., Newport, Tenn., will issue bonds for \$7,000,000, part of fund to be used for acquisition of other properties and extensions and improvements in power plants and system. Company will take over Knoxville Power & Light Co., Knoxville, Tenn., and expand facilities.

Contracting Officer, Wright Field, Dayton, Ohio, will receive bids until Aug. 27 for one automatic screw machine; until Aug. 26 for aircraft fittings, including brace assemblies, plates, bolts, washers, tail wheel fork leg bearings, etc.; until Sept. 3 for two motor-generator sets, and 30,000 hose clamps; until Sept. 2 for 270 light and streamline assemblies for airplanes.

State Board of Education, Nashville, Tenn., is considering a new State industrial college on local site, with vocational training facilities, to cost close to \$1,000,000. Walter R. McCornack, Buckley Building, Cleveland, is architect.

Providence Coal Co., Providence, Ky., contemplates rebuilding tipple at local mining properties, destroyed by fire Aug. 14, with loss about \$50,000 with equipment.

Tennessee Natural Gas Corporation, 502 Houston Street, Chattanooga, Tenn., is contemplating construction of natural gas pipe line with booster stations, etc., from Sunbright oilfields to Chattanooga and vicinity, to cost over \$350,000.

Pittsburgh

PITTSBURGH, Aug. 18.—The machinery business this month has shown little change from June and July, with orders few and scattered and new inquiry difficult to develop. However, buying for the larger industrial projects in this district is going on quietly and indicates a fair volume of business for the remainder of the year. Jones & Laughlin Steel Corporation has purchased the cranes required for its South Side and Aliquippa works and is expected to take action on considerable equipment in about two weeks. Occasional purchases by the Westinghouse Electric & Mfg. Co., East Pittsburgh, United States Aluminum Co., New Kensington, Pa., and Ingalls Iron Works, Verona, Pa., are contributing to order books while miscellaneous buying by smaller companies continues in a limited way.

The railroads have done less buying this year than in any recent comparable period and promise little activity in the near future.

Makers of heavy machinery and equipment are quite busy and will be engaged for the remainder of the year on present orders.

National Valve & Mfg. Co., 3101 Liberty Avenue, Pittsburgh, manufacturer of valves and kindred steam specialties, has plans for a one-story addition, 50 x 100 ft., to cost close to \$40,000 with equipment.

City Water Bureau, City-County Building, Pittsburgh, has plans for a new electric-operated pumping plant to replace present Brilliant station, to consist of six

main pumping units with capacity of 160,000,000 gal. a day, to cost \$900,000 with machinery. Edward G. Lang is director; James H. Kennon is managing engineer of water bureau.

United States Engineer Office, Pittsburgh, will receive bids until Sept. 3 for lock-operating machinery for lock No. 8, Allegheny River.

Hamilton Gas Co., 420 Lexington Avenue, New York, has purchased properties of Harsbarger Oil & Gas Co., operating at Milton, W. Va., including over 4500 acres of oil lands in Cabell County. New owner is considering increased output and distribution, including pipe lines, etc.

Board of Works, City Hall, Erie, Pa., will issue \$265,000 in bonds, fund to be used for construction of new electric-operated pumping station for municipal waterworks, including machinery installation.

Owens-Illinois Glass Co., Toledo, Ohio, with plants at Fairmont, Huntington and Charleston, W. Va., is planning establishment of a new operating unit at first-noted works, primarily for mold production for all plants in State, to cost over \$80,000 with machinery.

Capstan Glass Co., Connellsville, Pa., has placed a contract with Austin Co., Cleveland, for a warehouse, 116 x 200 ft.

Beckwith Machinery Co., Pittsburgh, distributor of tractors and farm implements, has awarded Austin Co. contract for one and two-story sales and service building, 104 x 116 ft. A five-ton crane will be installed.

Milwaukee

MILWAUKEE, Aug. 18.—The machine-tool market is not quite so listless as during July and early August, but bookings are at a low level. Several shops report increasing inquiry for single items, usually for urgent replacements. Production is fairly well maintained, although schedules in some shops are threatened with further reduction as old orders are completed.

Board of Vocational Education, South Milwaukee, Wis., has placed general contract with Pehrson Brothers, 555 Gateway Bank Building, Minneapolis, for new vocational school, to cost \$100,000 with equipment. Architects are Parkinson & Dockendorff, La Crosse, Wis. Herman Daehling is secretary of board.

Gillette Rubber Co., Eau Claire, Wis., manufacturer of tires, tubes, mechanical rubber goods, etc., has contracted with Hoeppner & Bartlett Co., 414 East Grand Avenue, local, for two-story plant addition, 40 x 200 ft.

Bids are being taken until Aug. 27 by M. P. Doherty, city clerk, Green Bay, Wis., for installation of one 500,000-gal. steel water storage tank, 110 ft. high, for municipal waterworks. F. J. Steeno is city engineer.

K. M. Keeley Trust Estate, care of Edward Tough, 119 East Washington Street, Madison, Wis., architect, is taking bids for construction of public garage and maintenance station, 100 x 156 ft., part two stories and basement, to cost about \$100,000.

Triple-A-File Co., 725 South Pierce Street, Milwaukee, established two years ago to manufacture special type files, is incorporating under same style, with capitalization of 500 common shares of no par value. Some additions are being made to equipment. E. A. Anheuser is president and general manager.

Oconto County Board of Supervisors, Oconto, Wis., has authorized purchase of former plant of defunct Montana Tractor Co. and investment of about \$25,000 for alterations and new equipment for use as general machinery storage and repair base for County highway equipment. Addition costing about \$25,000 is planned next spring.

Moloch Foundry & Machine Co., Kaukauna, Wis., has completed electric steel foundry extension with capacity of five tons, costing, with other improvements, about \$200,000. Company is making an issue of \$100,000 in first mortgage bonds to cover part of cost of improvement. Besides doing general foundry jobbing business, company manufactures power hammers, pumps, automatic stoking equipment and other specialized machinery. Normal employment ranges from 250 to 300, with 175 at work at present. R. M. Kanik is president and general manager.

Oilgear Co., Milwaukee, has changed its address to 1403 West Bruce Street, that city.

Detroit

DETROIT, Aug. 18.—American Enameled Wire Co., Port Huron, Mich., is completing removal of plant from Muskegon to new building at Port Huron, where production will be concentrated and facilities provided for increased output. Company is a subsidiary of Electric Auto-Lite Co., Champlain and Mulberry Streets, Toledo, Ohio.

Cohodas Brothers, Inc., Ishpeming, Mich., will take bids at once on general contract for one-story and basement cold storage and refrigerating plant, totaling about 15,000 sq. ft. floor space, to cost about \$70,000 with machinery. D. E. Anderson, Marquette, Mich., is architect.

S. P. A. Truck Corporation, South Bend, Ind., recently organized by officials of Studebaker Corporation to take over and consolidate Studebaker and Pierce-Arrow motor truck production, will succeed to two plants of parent company on Clark and Piquette Avenues, Detroit. New machinery will be installed in a number of departments and it is expected to begin motor truck manufacture within 60 days, including parts production and assembling for light and heavy-duty trucks and delivery vehicles. New line of 1½ and 2-ton capacity units will be produced. Albert R. Erskine, president of Studebaker Corporation, will be president of new truck subsidiary; J. M. Cleary, vice-president and general manager; and F. L. Sage, formerly chief engineer for truck division of Dodge Brothers, Inc., Detroit, will act in like capacity for S. P. A. organization.

Toledo Edison Co., 512 Jefferson Avenue, Toledo, Ohio, will construct and operate a steel tower transmission line to Monroe, Mich., to cost \$160,000.

Tullar Envelope Co., 2766 West Fort Street, Detroit, has plans for a two-story addition, to cost about \$55,000 with equipment. Stahl & Co., McKerchey Building, are architects.

Sparks-Withington Co., Jackson, Mich., manufacturer of automobile accessories, radio equipment, etc., is concluding purchase of plant and business of Cardon Phonocraft Corporation, Jackson, manufacturer of radio tubes and equipment, and will consolidate, expanding present capacity in that line.

Calumet & Hecla Consolidated Copper Co., Lake Linden, Mich., will expend over \$1,000,000 in connection with new

steam-operated electric power plant at Ahmeek, Mich. Project will include a transmission line, switching facilities, etc., with power output used primarily at mines of Calumet company. Stone & Webster Engineering Corporation, 38 South Clark Street, Chicago, is engineer.

Industrial Electric Mfg. Co., Wayne, Mich., manufacturer of oil and gasoline strainers, etc., has changed its name to Industrial Wire Cloth Products Corporation.

Detroit Edison Co., 2000 Second Avenue, Detroit, has plans for one and two-story equipment storage and distributing plant, 103 x 200 ft., at Pontiac, with repair facilities. Project will include an automobile service, repair and garage unit for company motor trucks and cars, and will cost about \$170,000 with equipment.

St. Louis

ST. LOUIS, Aug. 18.—Board of Education, 911 Locust Street, St. Louis, will receive bids until Sept. 3 for power plant equipment, including a uniflow engine, boiler and stokers.

Eagle-Picher Lead Co., Joplin, Mo., is contemplating an addition to local mill, primarily for production of mineral wool, to cost close to \$40,000 with machinery. Headquarters are at 131 North La Salle Street, Chicago.

Butts Electric Co., 504 West Second Street, Oklahoma City, Okla., has awarded general contract to Bush Construction Co., Herskowitz Building, for one-story machine shop, 60 x 140 ft., to cost about \$30,000 with equipment.

City Council, Paragould, Ark., has called a special election for Sept. 21 to approve bond issue of \$125,000 for installation of a municipal electric light and power plant, for which plans are being drawn by W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, engineer.

Kansas Power & Electric Co., Lawrence, Kan., will build new equipment storage and distributing plant, with repair department, to cost about \$40,000 with equipment. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are architects. Same architects have plans for a new power substation for company near Bonner Springs, Kan., with switching facilities, etc.

R-F Electrical Mfg. Co., Shawnee, Okla., is planning one-story addition for machine department, with installation of new tools and equipment.

State Board of Administration, State House, Topeka, Kan., is asking bids on general contract until Aug. 26 for two-story addition to industrial school for blind at Kansas City, Kan. List of equipment will soon be arranged. Joseph W. Radotinsky, State House, is State architect, in charge.

Oklahoma Carbon Industries, Inc., Sayre, Okla., has begun construction of new carbon black manufacturing plant, to cost over \$150,000 with air compressors and other equipment.

Boeing Air Transport, Inc., Georgetown Station, Seattle, has awarded general contracts to Austin Co., Cleveland, for hangars at airports at Omaha and North Platte, Neb., with shop and reconditioning facilities, to cost about \$65,000 and \$45,000, in order noted.

Burdett Oxygen Co., 2725 East Alice Street, Oklahoma City, will soon begin

superstructure for one and one-half story commercial oxygen plant, 50 x 75 ft., to cost about \$40,000 with equipment. General contract recently was let to Harry Reynolds Construction Co., Franklin Building.

Andrew H. Kauffman, receiver for Allegheny Tube & Steel Co., 1308 North Main Street, St. Louis, has received a high bid of \$40,000 for property from interests represented by A. Wolf, and it is said that Federal Court will authorize sale.

Champlin Refining Co., Enid, Okla., has surveys under way for oil pipe line from Oklahoma City oilfields to pipe line system near Lovell, to cost over \$150,000.

Gulf States

BIRMINGHAM, Aug. 18.—American Cast Iron Pipe Co., Birmingham, will soon begin superstructure for a one-story addition to mono-cast iron pipe foundry, for which general contract has been let to Southern Steel Works, Inc., Birmingham. It will be used for production of high pressure pipe sections and will cost about \$50,000 with equipment.

Birmingham Electric Battery Co., 2230 Second Avenue, Birmingham, has awarded a general contract to J. I. Borriess, Comer Building, for two-story addition, 25 x 140 ft., to cost close to \$40,000 with equipment. William L. Welton, American Trust Building, is architect.

Wisconsin National Fibre Can Co., 598 Clinton Street, Milwaukee, manufacturer of fiber and corrugated paper containers, cans, etc., is considering new branch plant at Fort Worth, Tex., comprising main one-story unit for production of about 5000 containers an hour, to cost over \$100,000 including equipment. It is understood that company will organize a subsidiary under Texas laws to operate project. Wisconsin company is affiliated with National Paper Can Co., Milwaukee address noted.

Trinity Valley Iron & Steel Co., 2100 Gandy Street, Fort Worth, Tex., has arranged for increase in capital from \$10,000 to \$100,000 for expansion.

Scott Lumber Co., Fulton, Ala., is considering new boiler house and machine shop in connection with rebuilding saw mill and lumber plant destroyed by fire Aug. 13.

Texas Electric Service Co., Fort Worth, Tex., has arranged for increase in capital by an amount of 20,000 shares of stock, no par value, estimated at \$20,000,000, part of fund to be used for expansion. At present an appropriation of about \$2,000,000 will be secured for extensions and improvements in power plants and transmission lines, including acquisition of other electric properties.

New Orleans Air Transport Co., New Orleans, in cooperation with Rankin Flying Service, Inc., Portland, Ore., and other interests, is planning new works for manufacture of airplanes and parts, including airfield with hangars, etc., and aviation school, entire enterprise to cost over \$500,000. A merger is being arranged between companies noted and which will also include Simplex Aircraft Corporation, now identified with New Orleans company.

Union Cotton Oil Co., West Monroe, La., has awarded general contract to J. L. Humble Construction Co., Monroe, for one-story unit for storage, distribut-

ing and other service, 90 x 200 ft., to cost over \$60,000 with equipment.

Board of City Commissioners, Meridian, Miss., has taken bids on general contract for one-story hangar, 94 x 100 ft., with shop and reconditioning facilities, and two-story administration building, 33 x 66 ft., at municipal airport, to cost over \$45,000 with equipment. Frank A. Fort, 1309 Twenty-fourth Avenue, is architect.

Oil Fields Engineering Corporation, Fort Worth, Tex., care of H. L. Kime, 1556 South Yorktown Street, Tulsa, Okla., recently formed by Mr. Kime and associates, is planning early establishment of new plant at Fort Worth, for production of oil and natural gas equipment, initial unit reported to cost over \$30,000 with machinery. John R. Long, Fort Worth, is interested in new company.

Walker Pure Food Products Co., Cotton Exchange Building, Fort Worth, Tex., is considering installation of elevating, conveying and other handling equipment in one-story factory, 80 x 135 ft., to cost over \$40,000. Bids are being received on general contract.

Southern Engine & Pump Co., 615 Washington Avenue, Houston, Tex., is planning new one-story unit for storage and distribution, to cost about \$25,000 with equipment. C. A. Leavens is president.

Indiana

INDIANAPOLIS, Aug. 18.—Board of Public Works, Goshen, is asking bids until Aug. 27 for an electric generating plant for municipal light and power service, including Diesel engines, generating units, pumping machinery and accessories.

Roach-Appleton Mfg. Co., South Bend, manufacturer of electrical switch boxes and kindred electrical equipment, with headquarters at 3440 Kimball Street, Chicago, has awarded general contract to Ralph Sollitt & Sons, 518 East Sample Street, for one-story plant, 200 x 250 ft., to cost about \$115,000 with equipment. Fett, Pearson & Goffeney, Associates Building, South Bend, are architects.

Herff-Jones Co., 1411-19 North Capitol Avenue, Indianapolis, manufacturer of jewelry and plated goods for schools, colleges, fraternal organizations, etc., has acquired plant and business of Dodge & Ascher, Inc., 706 Townsend Street, Chicago, manufacturer of kindred specialties, and has removed business to Indianapolis, where production will be concentrated and expansion carried out.

Indianapolis Power & Light Co., Indianapolis, has arranged for a bond issue of \$8,000,000, part of proceeds to be used for extensions and improvements. Company has work under way on first unit of new super-power steam-operated electric generating station on White River, near city, to have initial capacity of 70,000 kw., and which will be increased to 140,000 kw. later.

Board of Education, Hammond, L. L. Caldwell, 1149 Forest Avenue, superintendent, is considering installation of manual training facilities in new two-story and basement high and grade school to cost over \$200,000, for which revised plans are being prepared. Bids will be asked on general contract early in September. Louis C. Hess, First Trust Building, is architect.

Pacific Coast

SAN FRANCISCO, Aug. 14.—Oliver United Filters, Inc., Fourth and Madison Streets, Oakland, Cal., manufacturer of filtering machinery and parts, has plans for group of one-story units at Fruitvale, Cal., for parts production and assembling, to cost over \$400,000 with equipment. Present plant will remove to new location and increase output. Reed & Corlett, Oakland Bank of Savings Building, are architects.

Inter-Continental Rubber Co., Salinas, Cal., care of G. H. Carnahan, Salinas, president, has acquired property near city for erection of new plant, to cost over \$125,000 with machinery. A power station and machine shop will be included.

Tracy Grammar School District, Tracy, Cal., has plans for one-story manual training building at local school group, to cost about \$25,000 with equipment. W. J. Wright, Mail Building, Stockton, Cal., is architect.

C. A. Perry, Healdsburg, Cal., is interested in organization of new company which plans erection of local ice-manufacturing and cold storage plant, to cost over \$125,000 with machinery. Healdsburg Chamber of Commerce is also active in enterprise.

Board of Trustees, Monterey Union High School District, Monterey, Cal., has plans for a one-story vocational shop building at high school group, to cost about \$35,000 with equipment. Swartz & Ryland, Spazier Building, Monterey, are architects.

McPherson Furnace & Supply Co., 441 North Nineteenth Street, Portland, Ore., has asked bids on general contract for one-story storage and distributing plant, 100 x 100 ft., with mechanical department, to cost about \$30,000 with equipment. Cash & Wolff, Railway Exchange Building, are architects.

F. C. Stettler Mfg. Co., 300 Oregon Street, Portland, manufacturer of folding paper boxes and containers, is planning to rebuild part of plant recently destroyed by fire.

Alameda Bay Airdrome, Alameda, Cal., has awarded a general contract to Lindgren & Swinerton, Inc., 225 Bush Street, San Francisco, for a one-story hangar and administration building at airport, 120 x 440 ft., to include machine and reconditioning shops and other departments, to cost about \$100,000 with equipment. R. U. St. John is field manager in charge.

School District of Deschutes County, Bend, Ore., has plans for a one-story trade and industrial school, 50 x 320 ft., to cost over \$80,000 with equipment. Johnson, Wallwork & Johnson, United States Bank Building, Portland, are architects. D. B. Stuart is clerk for board.

Superior Furniture Mfg. Co., Long Beach, Cal., has awarded a general contract to Harris & Chase, 818 Orange Grove Avenue, Los Angeles, for one-story addition, 25 x 120 ft., to cost over \$65,000 with equipment.

Canada

TORONTO, Aug. 18.—Excavation work has been started on a \$250,000 addition to plant of Anaconda American Brass, Ltd., New Toronto, Ont. Plans include alterations to present building. Considerable new equipment will be purchased.

Dominion Foundries & Steel, Ltd., Hamilton, Ont., will spend \$300,000 to increase company's steel plate and bloom capacity, according to C. W. Sherman, president. Expenditure will be largely for new equipment to further diversify company's products and help stabilize operations and employment.

Negotiations have been completed for a two-story building at 484 Dundas Street West, Toronto, to be occupied by Thornycroft, Canada, Ltd., and Simms Motor Units, Ltd., Canadian branch factories of British companies. Thornycroft, Canada, Ltd., is a subsidiary of John I. Thornycroft & Co., Ltd., London, manufacturer of six-wheel motor trucks, marine engines, etc. C. A. Belcher will be in charge of Toronto plant. Simms Motor Units, Ltd., with headquarters in London, has 23 factories throughout Empire and manufactures magnetos and other automotive equipment. George P. Dowe is Canadian manager.

Bids will be received by B. S. Wemp, chairman of Board of Control, Toronto, until Aug. 26 for one 3,000,000 gal., two 11,500,000 gal. centrifugal pumps and appurtenances.

Roundhouse of Canadian National Railways, Hamilton, Ont., was damaged by fire with total loss of about \$75,000.

Town of Westmount, Que., will spend \$160,000 on improvements to electric power plant. Arthur T. Bell is secretary-treasurer.

Pattern shop and equipment of Canada Iron Foundries, Ltd., Stuart Street, Hamilton, Ont., was recently damaged by fire, with loss of about \$35,000.

Bids will be received by B. S. Wemp, chairman of Board of Control, Toronto, until Aug. 26, for one 4-ton traveling crane and hoist.

Ontario Power Service Corporation, Ltd., subsidiary of Abitibi Power & Paper Co., Ltd., 88 University Avenue, Toronto, has awarded general contract to Dominion Construction Co., Ltd., Redford Building, Toronto, for a power plant to develop 275,000 hp. at Abitibi Canyon, Ont., to cost \$20,000,000. Construction will start at once.

New Brunswick Electric Power Com-

mission, 55 Canterbury Street, St. John, N. B., contemplates erection of a \$750,000 power plant at Newcastle Wharf, N. B.

Tenders will be called at once for a one-story addition, to cost \$10,000, for Taylor Electric Co., Ltd., 526 Adelaide Street, London, Ont. Watt & Blackwell, 288 Dundas Street, are architects.

Foreign

IN connection with operations at new superphosphate plant of Soviet Russian Government, Moscow, at Konstantinowska, recently started, plans are under way to provide additional production facilities to increase capacity from 200,000 tons a year to 300,000 tons, work to be completed in 1931.

Officials of Air L'liquide, Ltd., Paris, France, manufacturer of chemical products, have secured a large interest in Societe de Produits Perocycle, Ltd., Paris, recently formed with a capital of 12,000,000 fr. (about \$450,000) to develop electrolytic processes and equipment for metal plating. New company plans erection of new plant, for which site is being selected. Weissenfels G.m.b.H., Berlin, Germany, manufacturer of chemicals, will have an interest in new company.

Airport Commission, Panama, Panama, recently appointed by Legislature to develop airport facilities for country, is asking bids until Sept. 22 for construction of airfield at Albrook, including administration building, hangars, repair shops, oil storage and other field units, to cost \$1,750,000 with equipment. Commission is also considering a development for airfield at France, Panama, to cost close to \$1,000,000.

International Standard Electric Corporation, 67 Broad Street, New York, manufacturer of electrical and telephone equipment, parts, etc., for export, a subsidiary of International Telephone & Telegraph Corporation, same address, has arranged for an increase in capital from 500,000 to 1,000,000 shares of stock, no par value, part of proceeds to be used for expansion in output.

Ford Motor Co., Dearborn, Mich., has purchased property at Genoa, Italy, for new assembling plant for automobiles and tractors. Works will cost over \$500,000 and will handle automobile parts from Ford plant at Barcelona, and tractor parts from Ford plant in Ireland. Assembling works at Trieste will be removed to new location.

Lima Aviation School, Lima, Peru, recently formed as a municipal enterprise, is planning purchase in United States of dual-control instruction airplanes.

Work will begin at once on new power plant for Monterrey, Mexico, to include substation, boiler house, homes for officials, and later a complete change of distributing system. Initial investment in buildings and equipment is about \$250,000. Further information may be had from Bureau of Foreign and Domestic Commerce, Washington, reference Mexico 1926.

Five more hydroelectric generators rated at 77,500 kv.-amp. each are to be added by Soviet Russian Government to four now under construction in America for Dnieper River development at Kichkas, near Zaporozhe, in Ukraine. First four generators are being built by General Electric Co. at Schenectady, and fifth will also be constructed there. Remaining four will be built jointly at Schenectady and in Russia, with assembly of units in latter place.

Lake Superior Iron Ore Shipments

(In Gross Tons)

Port of Shipment	July, 1930	July, 1929	Season to Aug. 1	
			1930	1929
Escanaba	743,291	1,071,570	2,046,857	3,214,821
Marquette	582,151	634,369	1,581,916	2,262,363
Ashland	947,639	1,307,599	2,589,482	4,105,648
Superior	2,545,920	3,087,305	7,417,352	9,515,349
Duluth	2,625,318	3,484,009	7,249,852	10,429,324
Two Harbors	1,142,330	1,086,030	3,438,763	3,383,416
Total	8,586,649	10,670,882	24,324,222	32,910,820
Decrease	2,084,233		8,586,598	
Decrease, per cent. .	19.53		26.09	

From Lake Superior Iron Ore Association.

